5516

Walk Around

B-17 Flying Fortress

Walk Around Number 16

squadron/signal publications

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Boeing B-17G Flying Fortress

By Lou Drendel

Color by Don Greer

Illustrated by Ernesto Cumpian

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Introduction

Although it was far from the most produced bomber of World War II (12,677 B-17s were built, while 18,188 B-24s were built), the Boeing B-17 Flying Fortress has come to symbolize strategic bombardment during World War Two. Most of the literature, and all of the movies about WWII bombers star the B-17. Award winning movies such as Command Decision, Twelve O'Clock High, The War Lover, and Memphis Belle all featured the Flying Fortress.

The genesis of the B-17 was a 1934 Wright Field circular which invited bids on a new bomber which specified a payload of 2,000 lbs of bombs, a cruising speed of 200 mph and a range of 2,000 miles. The Boeing model 299 cost the company $275,000 to produce. It was a significant gamble in the middle of the depression, with no guarantee that the Army would buy their airplane. The model 299 introduced the classic B-17 configuration of four engines, side-by-side pilot and co-pilot, with the bombardier and navigator in the nose, radio operator behind the bomb bay, with gun blisters on the fusclage sides and in the floor. The aircraft rolled out on 17 July 1934 and made its first flight on 28 July, with Les Tower, Boeing's chief test pilot at the controls. After a series of test flights from Boeing Field, it launched for Wright Field on 20 August. The flight was a precursor to the career of the Flying Fortress, breaking all previous records with an average speed of 232 mph.

Military politics kept the B-17 from large-scale production throughout the rest of the 1930s. In spite of successful testing and several long-range good-will trips to South America, War Department opponents of long-range bombers resisted ordering the B-17. When three Fortresses from the 2nd Bombardment Group, commanded by Colonel Robert Olds, intercepted the Italian ocean liner Rex over 700 miles from the coast of America in order to prove they could rebuff an enemy force before it got close to American shores, the Army Air Corps was ordered to keep out of U.S. Navy territory!

Territorial prerogatives aside, the B-17 was too good an aircraft to ignore, and on 3 August 1937, the Army Air Corps signed a contract for the production of 39 B-17Bs. All were produced between October 1939 and March of 1940. These were followed by 38 B-17Cs in 1940, and 42 B-17Ds in 1941. The first 20 B-17Cs were turned over to the British under Lend Lease and named Fortress Mk I. Thirty-five of the B-17Ds were sent to Hawaii and the Philippines.

The success of the German Blitzkreig in Europe spurred production of warplanes, which produced the B-17E. The B-17E incorporated major modifications of earlier models, including a longer fuselage, a tail gunner's position, top and belly turrets, and a much larger vertical fin and rudder.

The B-17C/D would be the first Flying Fortress to see combat, fighting delaying actions against the Japanese in the Philippines and Java during early 1942. B-17Es were assigned to several units in the Pacific early in the war, but eventually most B-17 production went to the war in Europe with most bomber units in the Pacific being assigned the Consolidated B-24 Liberator.

The first mission flown by B-17Es of the 8th Air Force in Europe was a flight of twelve aircraft on 12 August 1942. This modest beginning was followed by a tidal wave of B-17Fs (3,405) and Gs (8,680) which eventually overwhelmed the Reich with hundreds of thousands of precision daylight bombing sorties.

Acknowledgements

It will be obvious to the reader that I am once again deeply indebted to my good friend Norm Taylor for the use of his extensive collection. Most of the period photos are from Norm. I am also grateful to the owners and operators of the several restored B-17s which I was allowed to climb in and around to get the detail photos. Thanks also to David F. Brown for sending me his B-17 photos.

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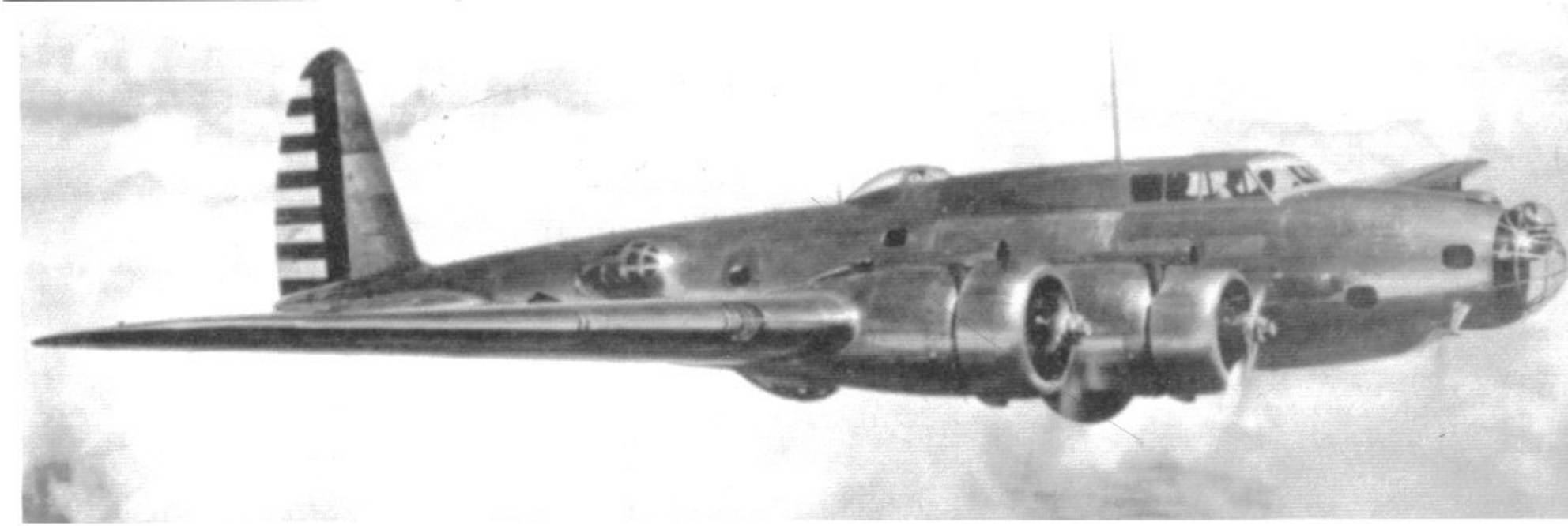
(Front Cover) The 490th Bomb Group's B-17G *Carolina Moon* flew 78 missions — more than any other Flying Fortress in the Group.

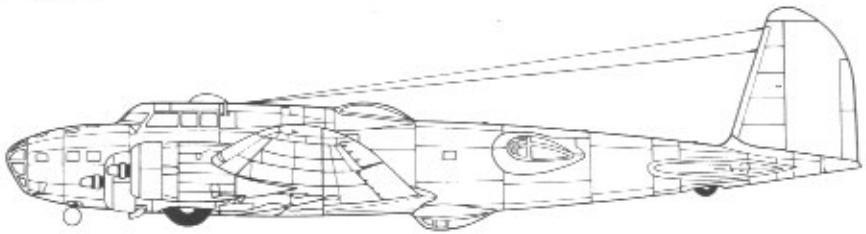
(Overleaf)"Shoo Shoo Shoo BABY" is a B-17G-35-BO built by Boeing and rolled off the Seattle production line in March of 1944. It was assigned to the 91st Bomb Group of the 8th Air Force. On it's 23rd mission it lost three engines and limped into Sweden, where it was impounded. It was eventually sold to Sweden, which converted it to an airliner and sold it to Denmark, which operated it in various civil roles until 1953, when it was sold to France. It continued it's civilian career until 1963, when it was relegated to the scrap heap. (David F. Brown.)

(Back Cover) LITTLE PATCHES was a camouflaged B-17G-25-BO assigned to the 91st BG. Her name is derived from the dozens of little aluminum patches used to repair flak damage incurred on her first mission in February of 1944.

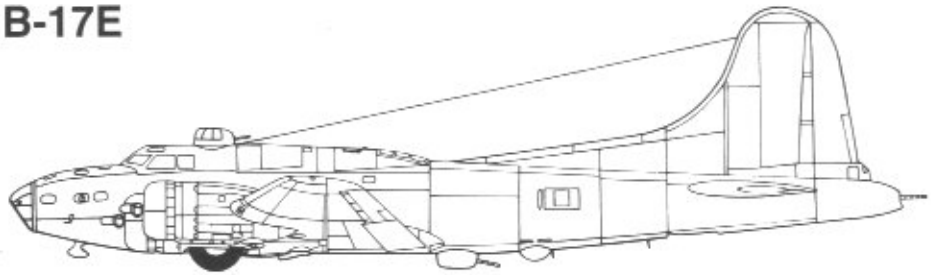


The Y1B-17 had the same external dimensions and armament as the Model B-299, the company funded prototype which led to the B-17. The nom de guerre Flying Fortress was coined by Seattle Times reporter Dick Williams, who commented that the "new bomber was a virtual flying fortress". Boeing quickly adopted the name.

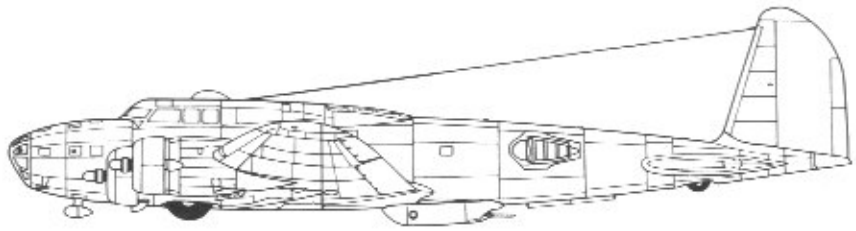
B-17B



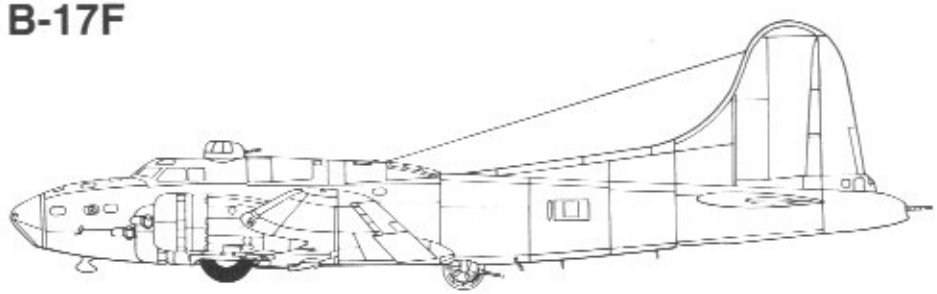
B-17E



B-17C



B-17F

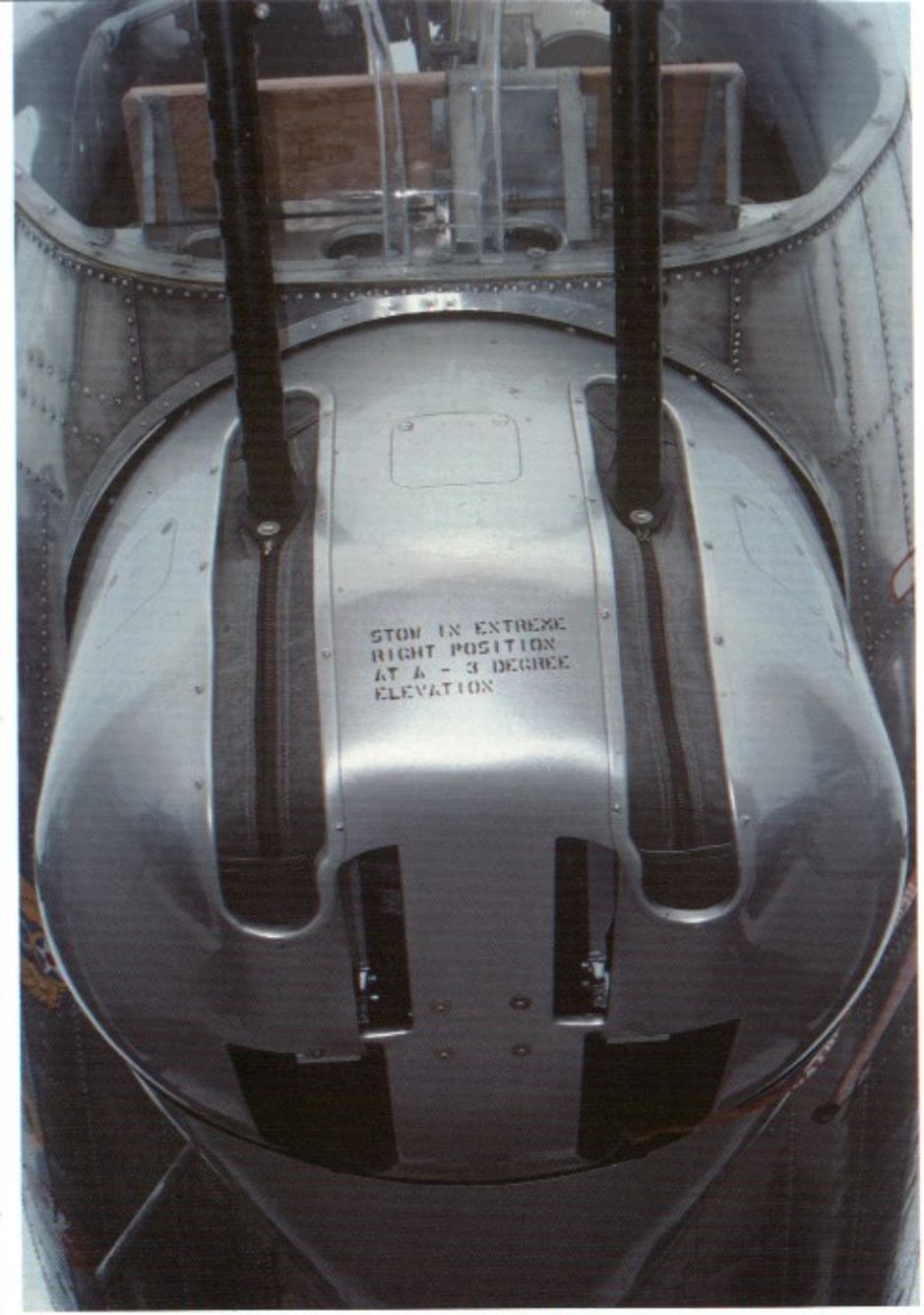


B-17G 44-8570 is owned and operated by the EAA Aviation Foundation as ALUMINUM Overcast. The weight of the huge Fortress on the tires noticibly flattens and bulges them. (Lou Drendel)

B-17G 44-85718 is operated by The Lone Star Flight Museum, Galveston, Texas, as THUNDER BIRD. The nose glass is non-standard, as are the four small windows above the chin turret. The original THUNDER BIRD was serial number 42-5172, which went missing on 17 April 1943. (Lou Drendel)

"Shoo Shoo Shoo BABY" was found in a French scrap yard by Steve Birdsall. The French government sold it to the U.S. government for 20 cents. It was returned to Wright Patterson AFB and in 1988, after 60,000 hours of restoration, she flew as the most perfect restoration of a B-17G. The artwork was re-created by Tony Starcer who had painted the original "Shoo Shoo Shoo BABY" in 1944. (David F. Brown.)

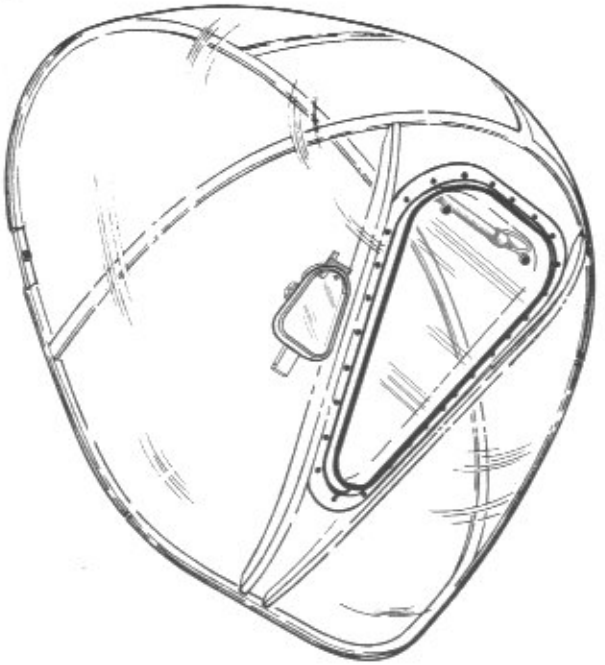
The Norden bomb sight mount can be seen through the lower glass panels of the Lone Star museum's B-17G. The chin turret was one of the defining external features of the G series. (Lou Drendel)



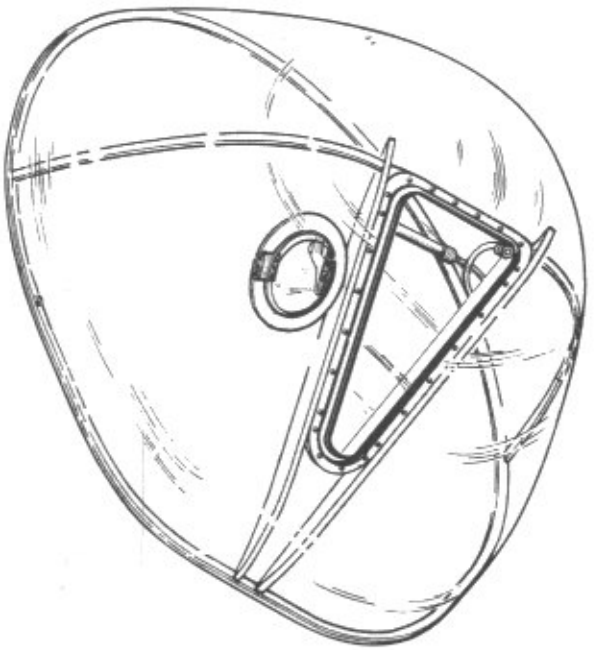
The chin turret of YANKEE LADY, a B-17G 44-85829 which is displayed by The Yankee Air Force Inc. The Bendix chin turret had a pair of .50 caliber machine guns which were operated by the Bombardier. (Lou Drendel)

TYPHOON McGOON II was a B-17E combat veteran on Guadalcanal 4 January 1943. It was common to cover the Norden bombsight while on the ground. The Norden bombsight was one of the most heavily guarded U.S. secret weapons of WWII. The larger of the Japanese flags represents the shooting down of a Type 97 Mavis Flying Boat. The smaller flags are Zero kills. (USMC)

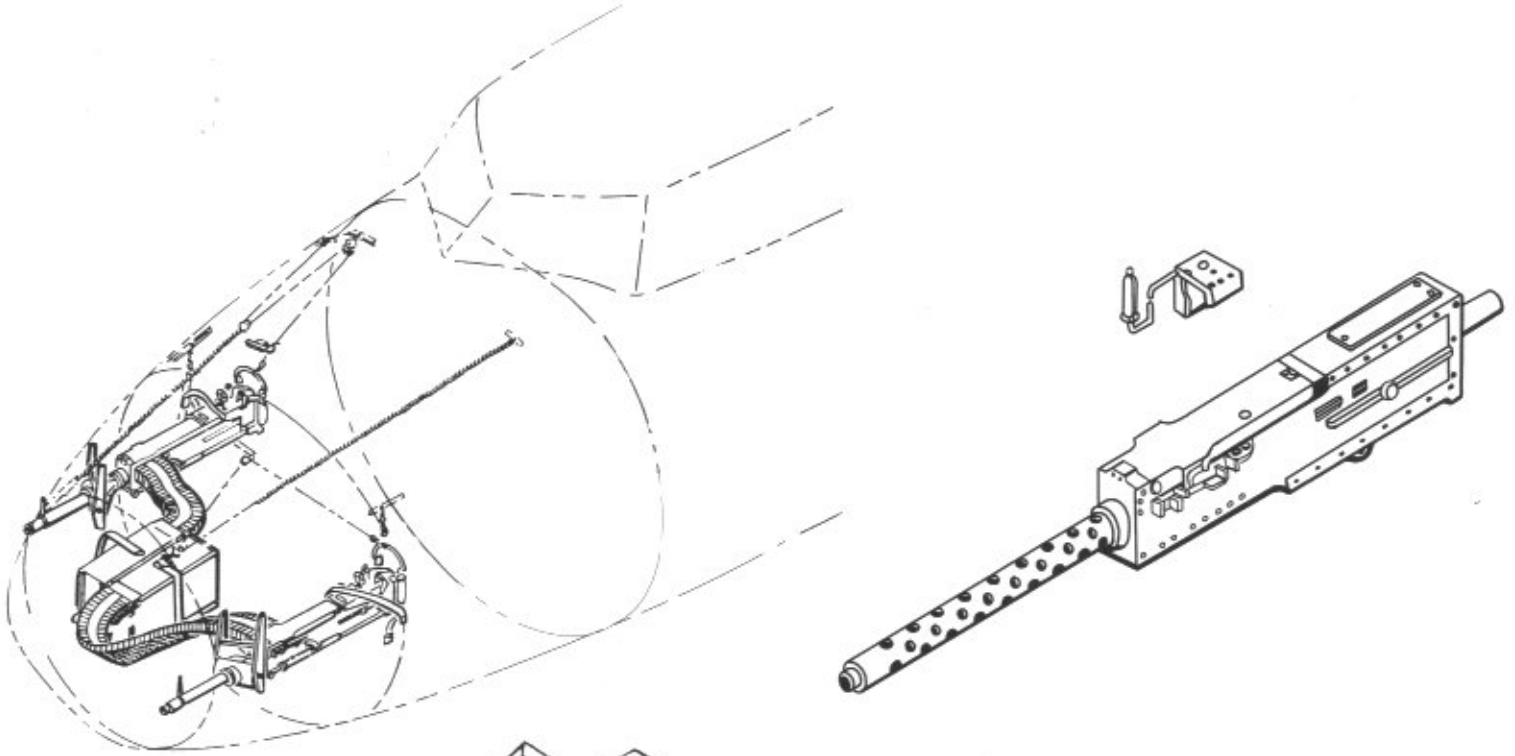
Nose Cone
B-17F - Early B-17G



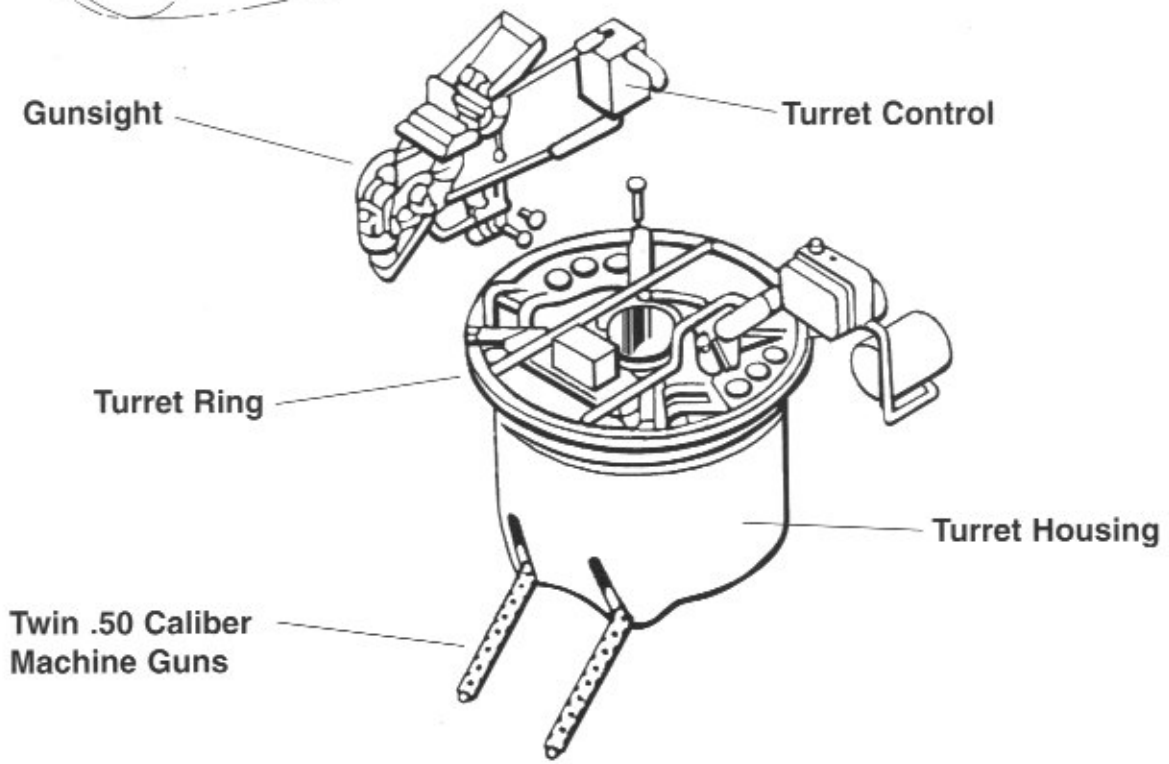
Nose Cone
B-17G



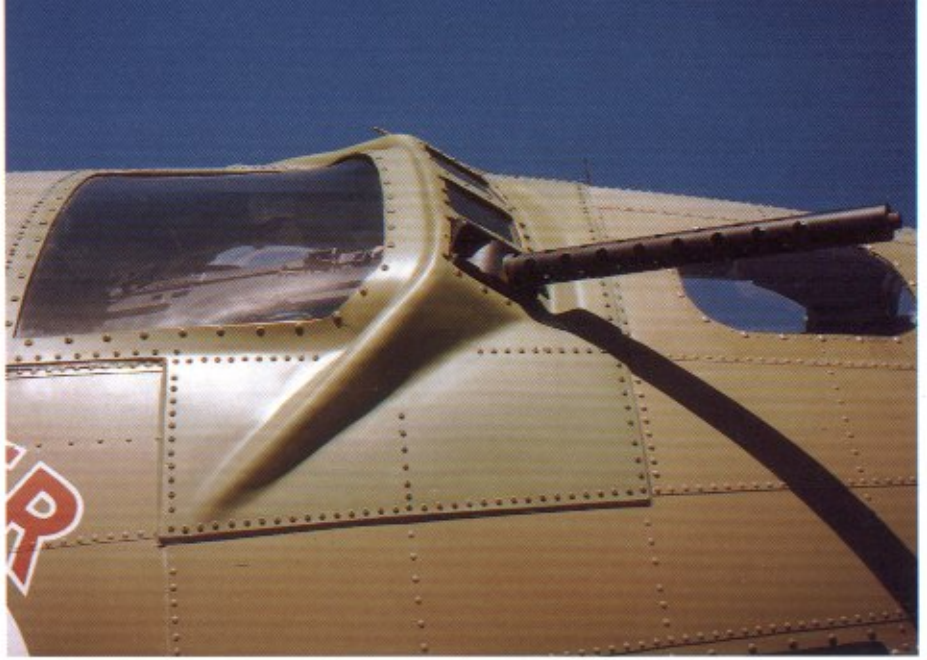
Cheek Guns



Chin Turret

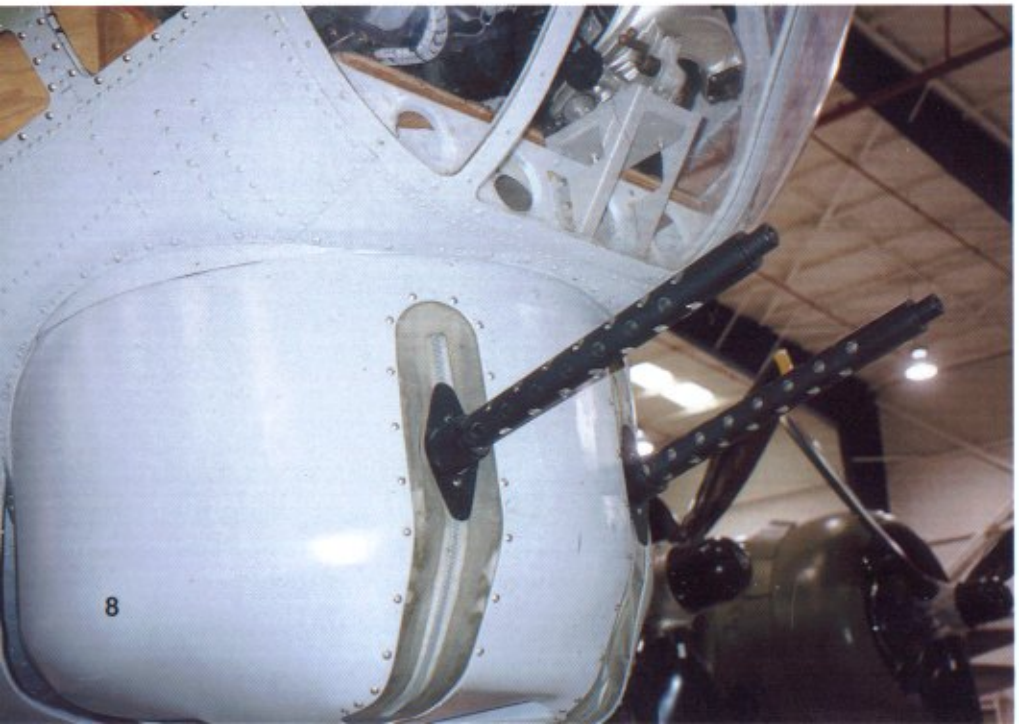


The Plexiglas nose of YANKEE LADY is representative of late model B-17Gs. The flat panel in the nose glass is to provide the Bombardier with an undistorted view through the bomb sight. (Lou Drendel)

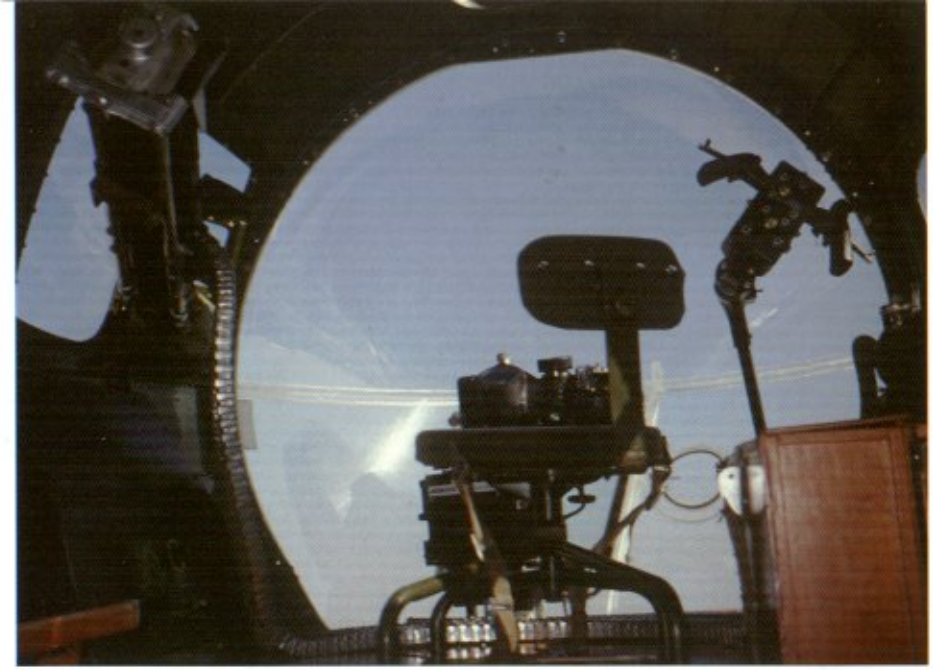


Additional 50 caliber machine guns were mounted on either side of the nose and were commonly referred to as cheek guns. This is the starboard, middle window, mount. (Lou Drendel)

The chin turret of THUNDER BIRD. The machine guns are Browning M-2 .50 calibers. (Lou Drendel)



The port side cheek gun, mounted in the forward window. These guns were normally operated by the Navigator. (Lou Drendel)

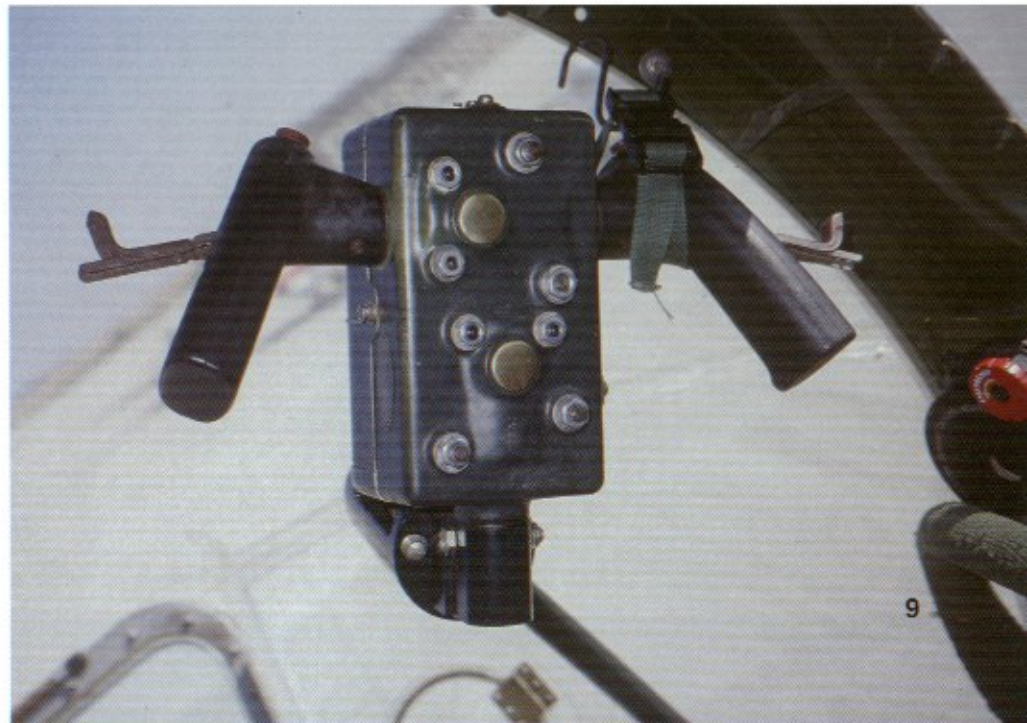


The Bombardier's chair and the controls for the chin turret guns of ALUMINUM Overcast. The wooden box at right contains ammunition belts for the two cheek guns. (Lou Drendel)

The controller for the chin turret guns. The turret moves in azimuth by rotating the controller. The guns move up and down by rotating the gun handles. (Lou Drendel)

The oxygen hose and regulator for the Bombardier is on the starboard side of the Bombardier's compartment just below the forward window. (Lou Drendel)

The gunsight, not seen here, was mounted on the ceiling. (Lou Drendel)



A B-17E of the 11th Bomb Group on the newly installed steel mat on Guadalcanal in December of 1942. The mat is laid down in small sections and is easily repaired. (USMC)

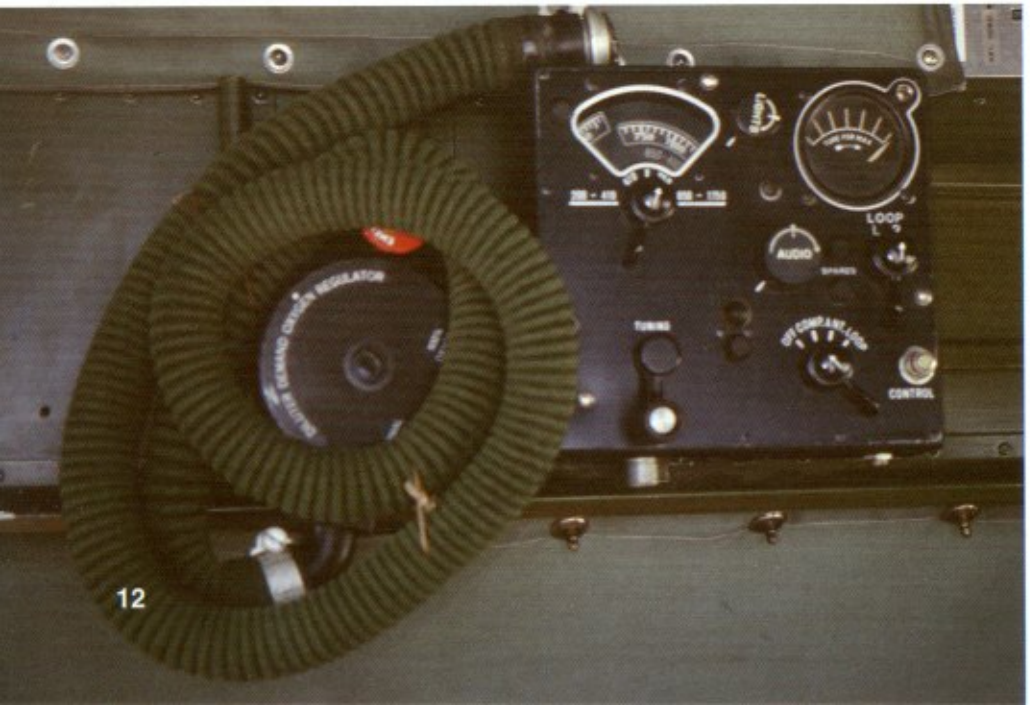
A B-17E of the 11th Bomb Group taxies out from Henderson Field, Guadalcanal, for a mission against Japanese shipping on 18 March 1943. Shortly after this picture was taken, the group was ordered back to Hawaii and converted to B-24 Liberators. (USMC)

Combat veteran B-17Gs of the 600th Bomb Squadron, 398th Bomb Group at Bradley Field, Connecticut are being serviced after their return flight from their wartime base in England. (LtCol Mike Moffitt, USAF (ret) via Norm Taylor Collection.)

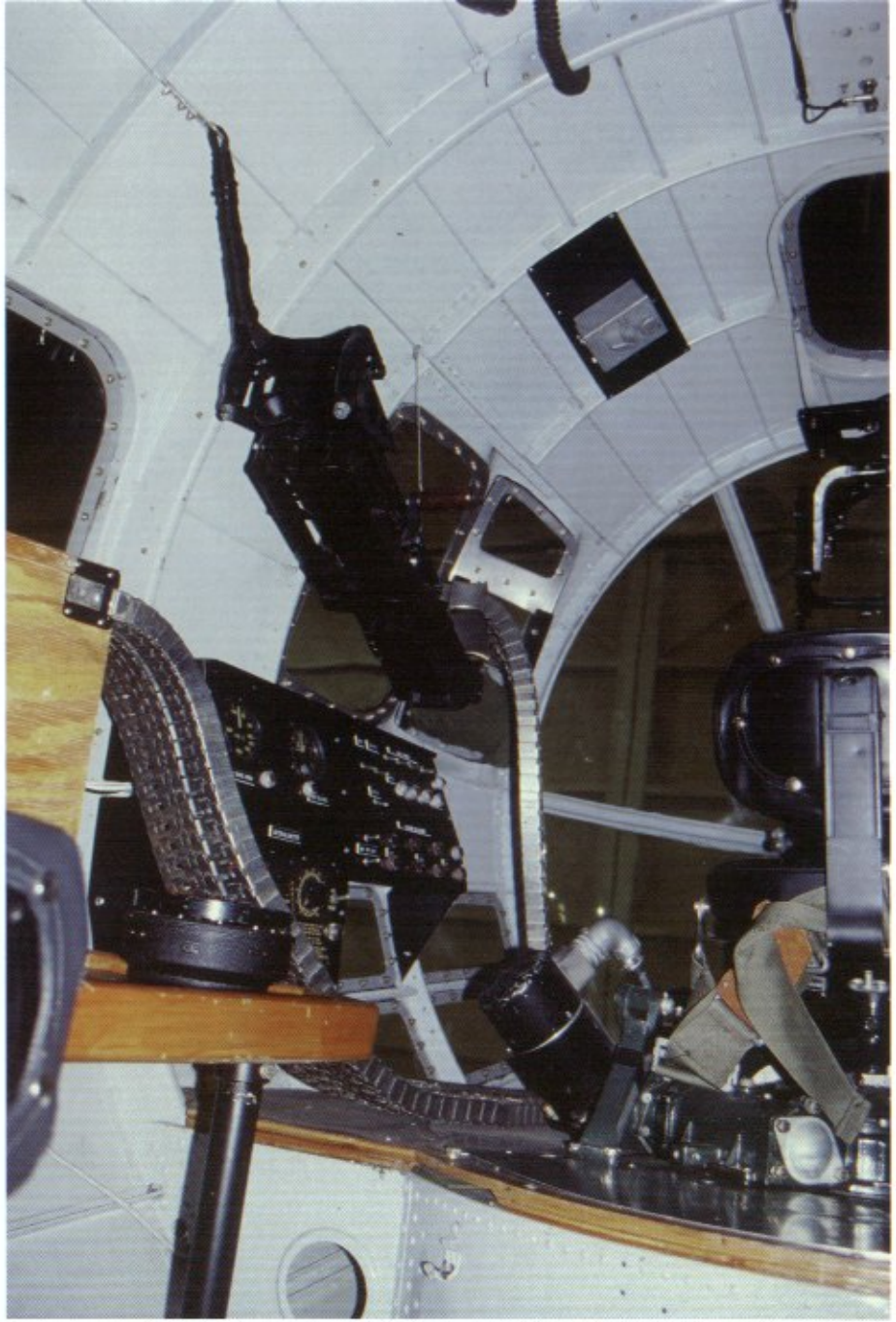
The Bombardier's intervalometer control panel in the nose of the B-17G. The intervalometer used a combination of aircraft altitude and speed to release the bombs at a specific interval. This allowed each bomb to hit the target at a predetermined distance from the next bomb. (Lou Drendel)

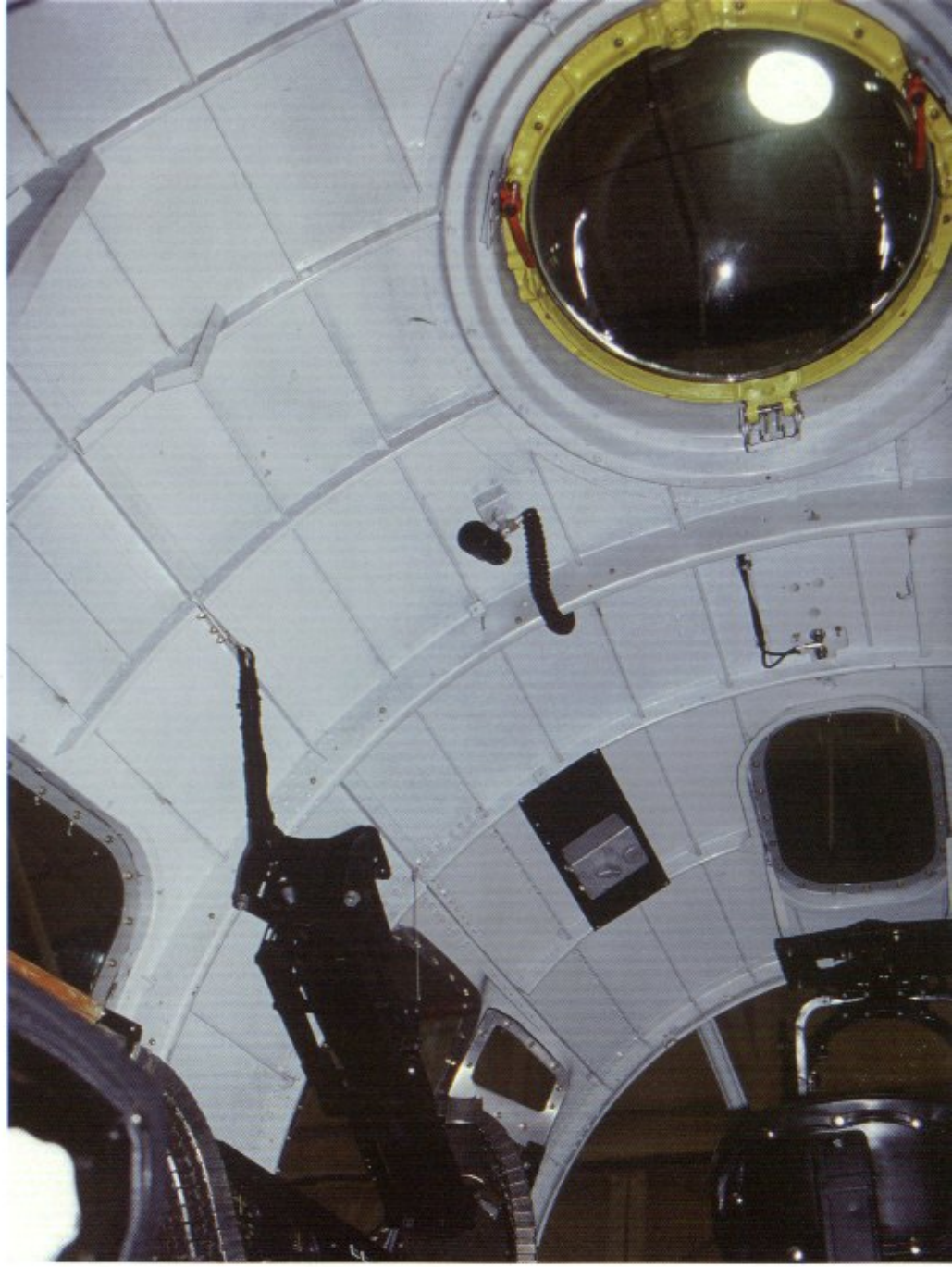
The port side cheek machine gun in the B-17G. The handle on the side charges the gun with a round from the feed belt. Each nose gun was equipped with 150 rounds of 50 caliber ammunition. (Lou Drendel)

Navigator's oxygen hose, regulator, and radio compass controls are mounted above the Navigator's work table on port side of the nose compartment. (Lou Drendel)

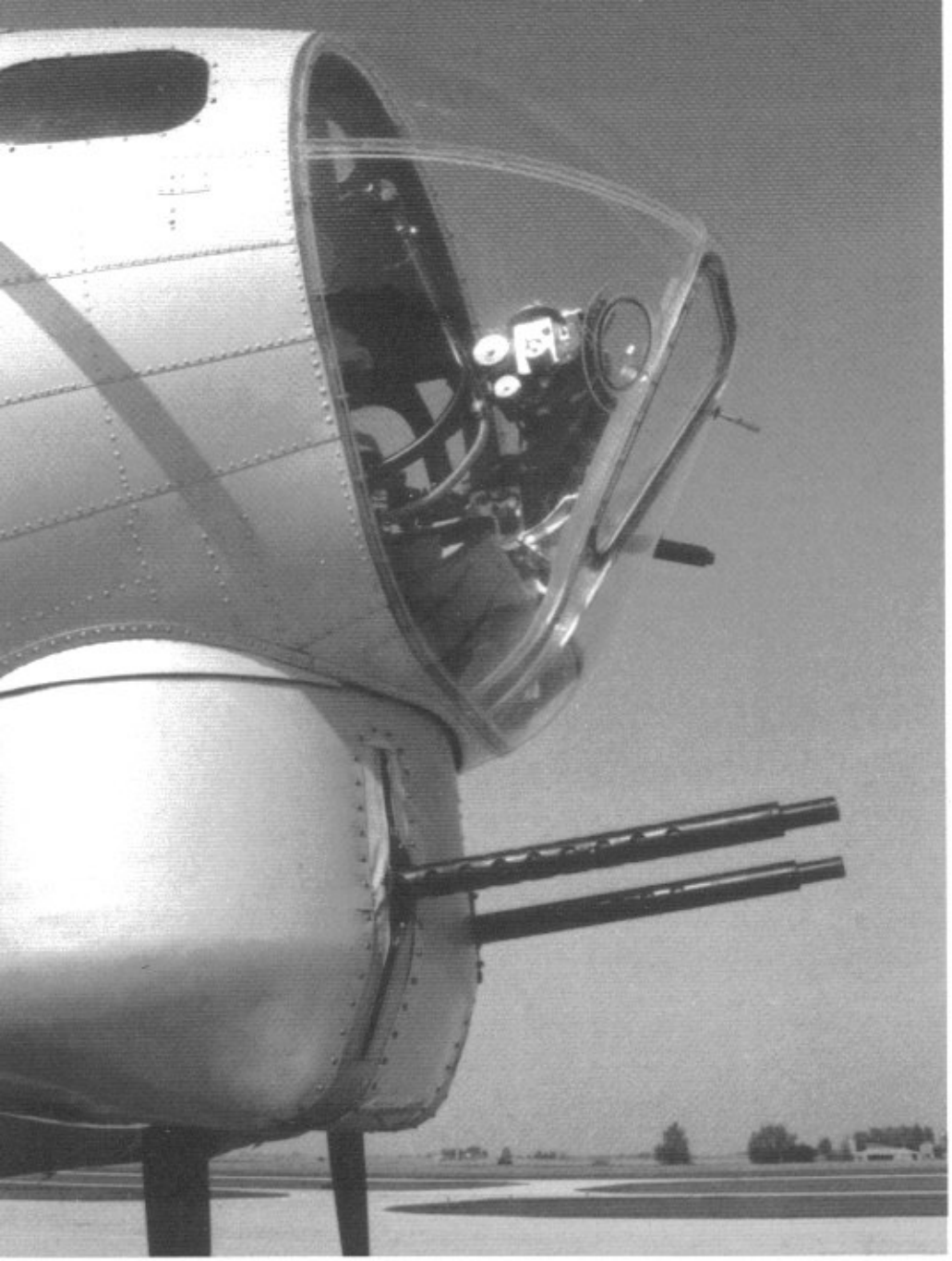


The Navigator's seat in THUNDER BIRD, the Lone Star Flight Museum's B-17G, has been upholstered for a comfort level not found in the original airplane. (Lou Drendel)

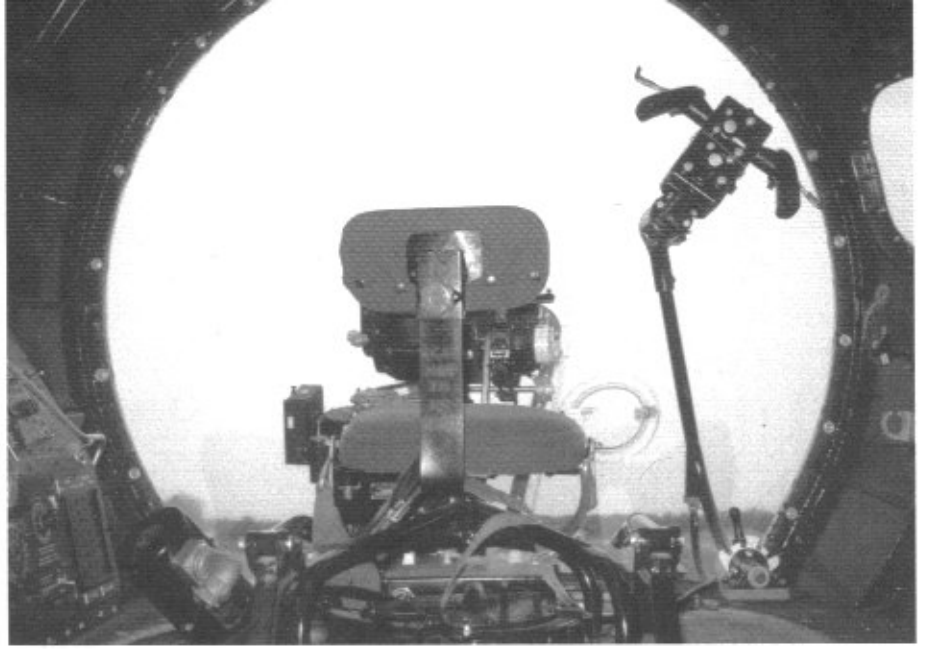




The nose compartment of the Lone Star B-17G, showing the Bombardier's control panel, the astrodome, and gunsight mount for the chin turret. The light gray interior paint, while inaccurate, shows off the pristine condition of this restoration. (Lou Drendel)

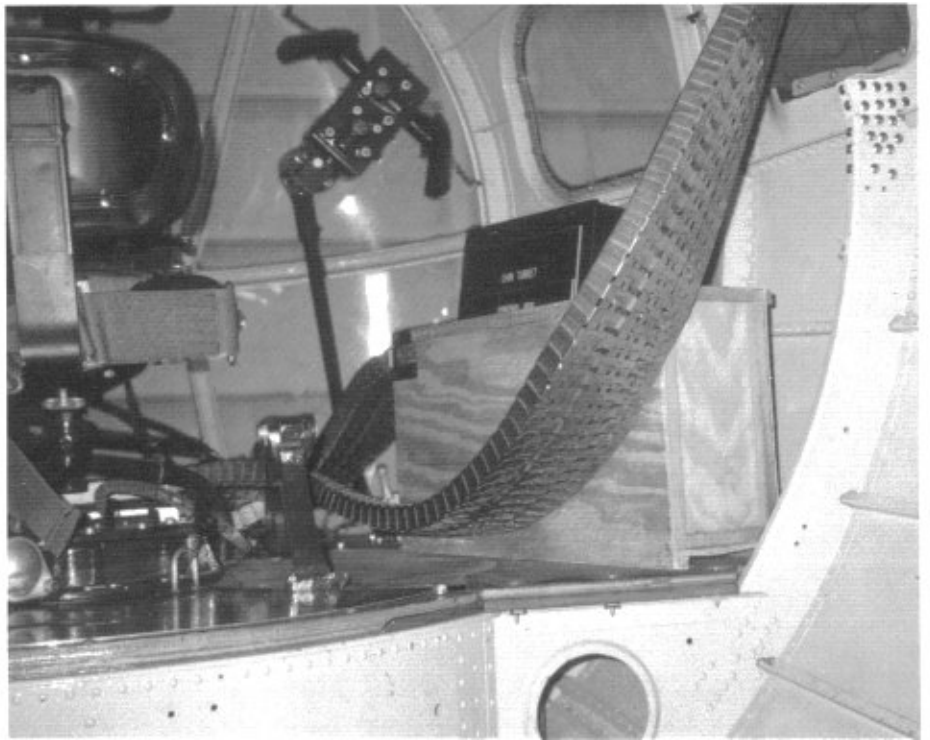


The nose of the EAA B-17 with the Norden bombsight unlimbered and ready for action. The chin turret contained 300 rounds for each M2 machine gun. The turret's bluntness had little aerodynamic effect on the B-17. (Lou Drendel)



The advantages of the B-17G are obvious. The chin turret allowed the removal of the glass mounted machine gun providing an unobstructed forward view. The chin turret controls are in the stowed position. Missing from this restoration is the sighting mechanism for the chin turret, which was mounted at the top of the nose bowl opening. (Lou Drendel)

A great deal of plywood was used for storage boxes in the Flying Fortress, which were often left unpainted. (Lou Drendel)



B-17G-15-VE (42-97519). The gunsight for the chin turret can be seen mounted at the top of the nose glass, but the Norden bombsight has been removed for this photo. Assigned to the 91st Bomb Group, 1st Bomb Wing, at RAF Bassingbourne, England in May of 1943. (Norm Taylor Collection.)

The navigator's work station on the port side of the nose compartment. Original WW II equipment includes the earphones hanging on the upper silver box, and the well-worn map case on the table. (Lou Drendel)

The upholstered bombardier's chair and the Norden Bombsight in the EAA B-17G. The Norden bombsight was developed by Carl L. Norden, appearing in prototype form in 1923. Several improvements followed, and the M15 bomb sight was ordered by the Air Corps in 1931. (Lou Drendel)

The Norden bombsight was slaved to the auto-pilot of the B-17, allowing the Navigator to control lateral movement of the bomber during the bomb run. The final series of the bombsight was the Mk 9. By the end of the war 43,292 Norden bombsights had been produced. (Lou Drendel)

Navigator chairs were made for smaller, lighter 1940s people. Boeing made extensive use of plywood for tables, some floors as well as ammunition boxes. (Lou Drendel)

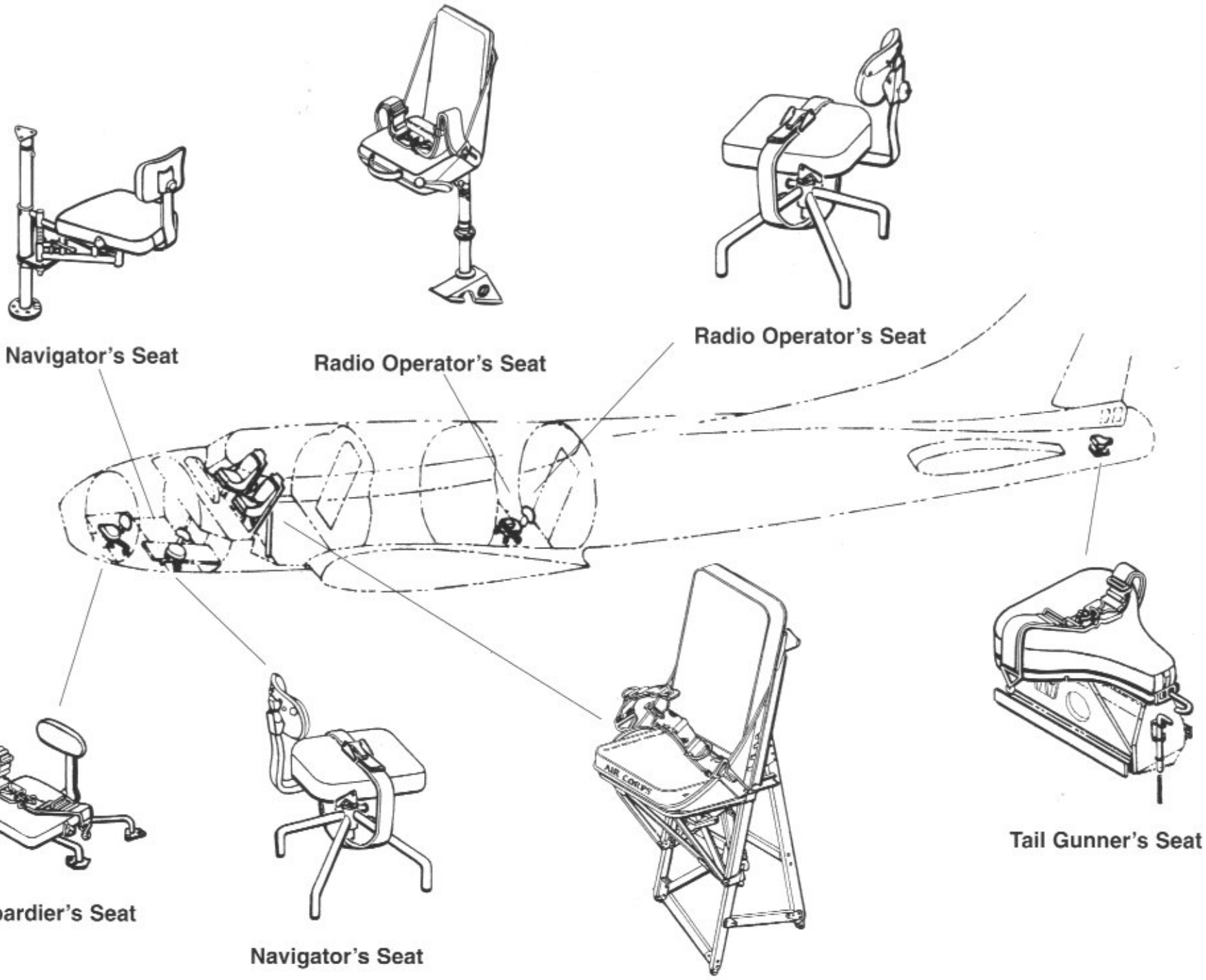
The machine gun charging handle was covered in wood. The belt feed of the Browning M2 machine gun in the port nose cheek position fed from the starboard side of the gun. (Lou Drendel)

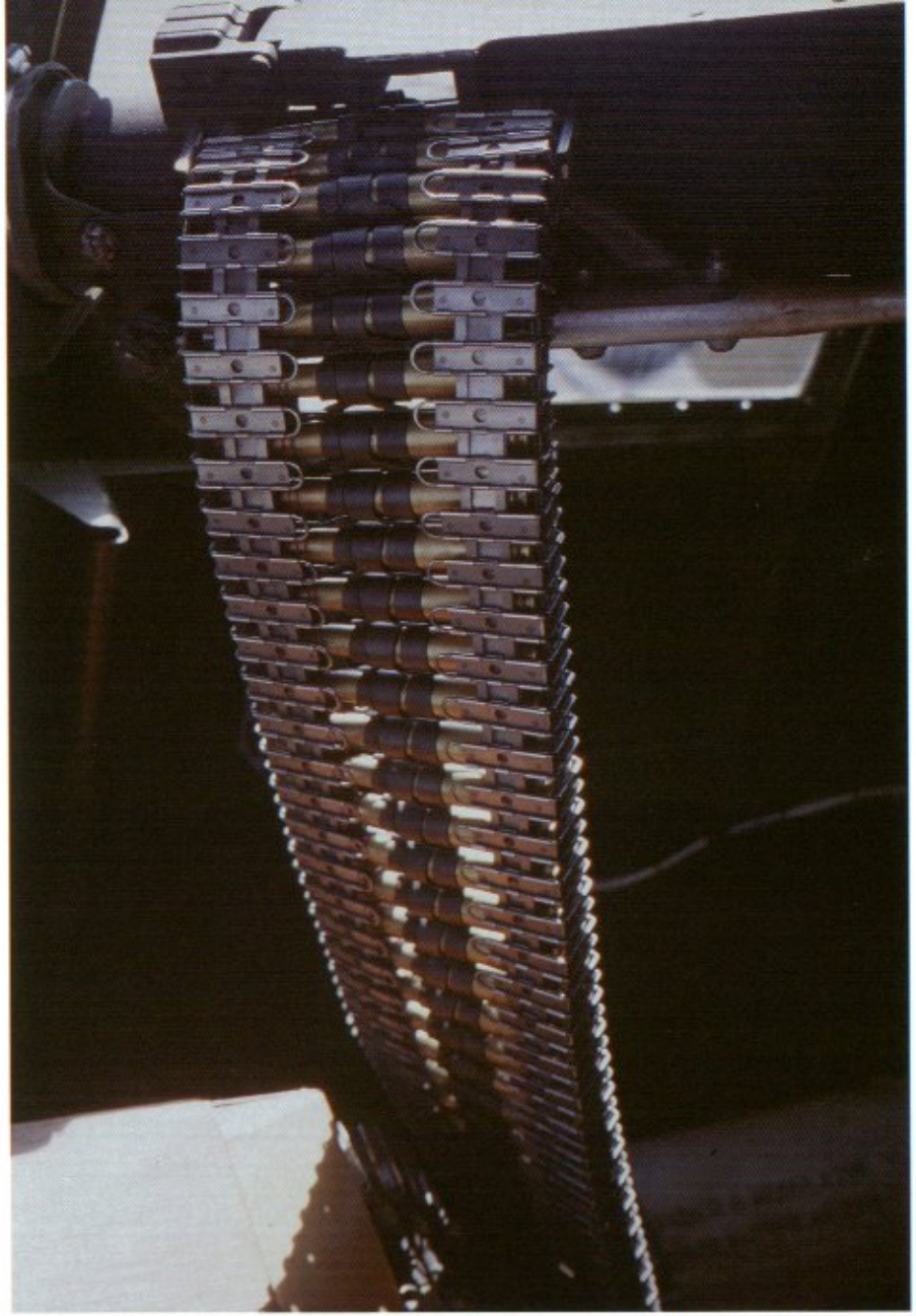
YANKEE LADY, the B-17G operated by the Yankee Air Force taxies at Goshen, Indiana in August of 1996. It was sans the top turret at this time. This B-17G-110-VE was one of the last 50 B-17s produced (only twelve additional B-17s rolled off the assembly line after this Vega produced Fortress.) (Lou Drendel

(Above) B-17G-110-BO (43-39346) of the 457th Bomb Group being serviced at Bradley Field, Connecticut on 22 May 1945, after return from the ETO. The B-17G carried 2,780 gallons of fuel in six wing tanks. An additional 820 gallons could be carried in two bomb bay auxiliary tanks. (LtCol Mike Moffit via Norm Taylor Collection.)

The B-17 carried life rafts in a fuselage compartment over the wings for use in the event of a water landing. (LtCol Mike Moffit via Norm Taylor Collection.)

(Below) Production of the B-17G began in July of 1943 after a B-17F-115-BO was modified with a chin turret to prove the concept. (Boeing via Norm Taylor Collection.)


Navigator's Seat
Radio Operator's Seat
Radio Operator's Seat
Bombardier's Seat
Navigator's Seat
Pilot and Co-pilot's Seat
Tail Gunner's Seat

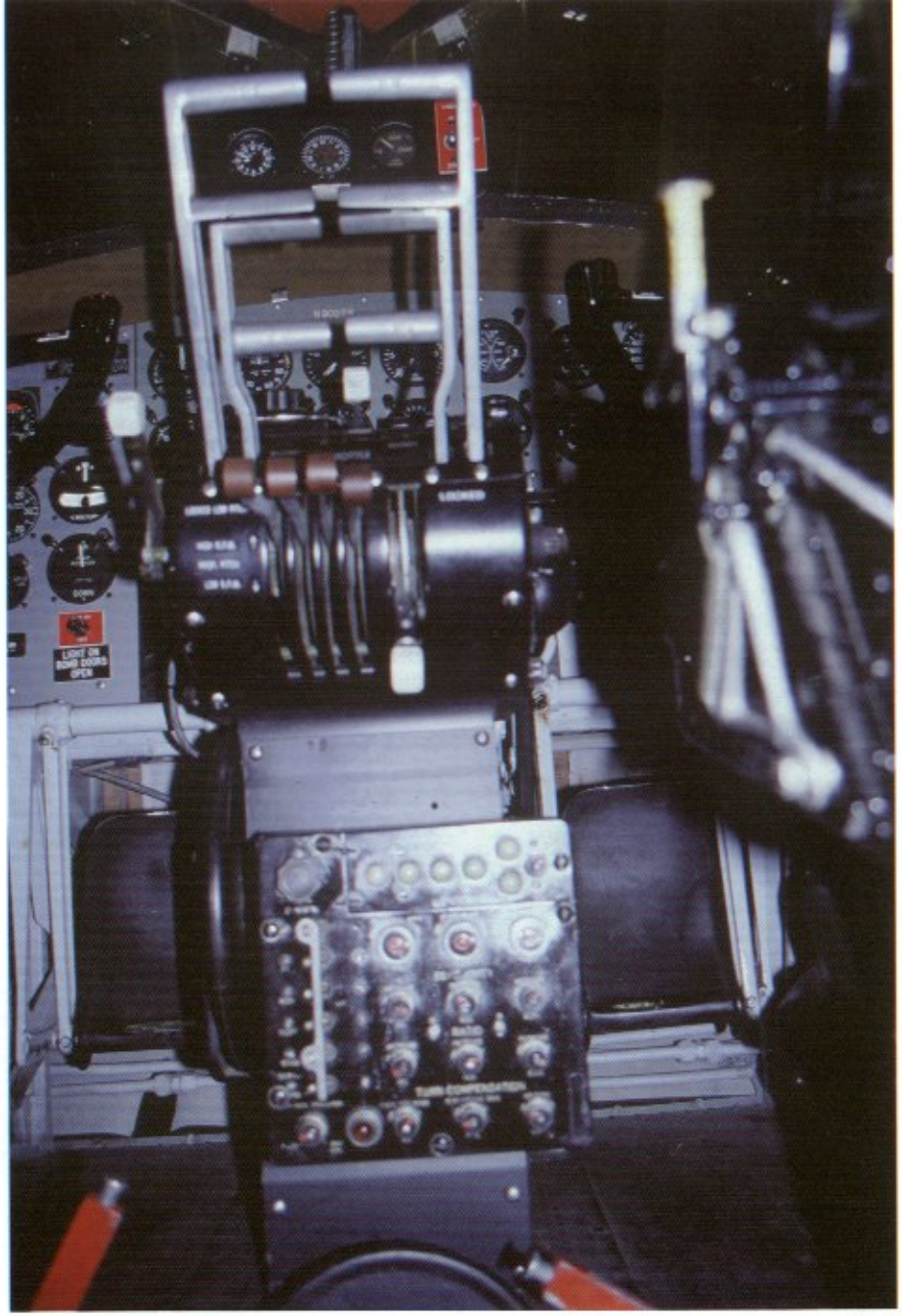


The ammunition belt feed on the starboard cheek gun is being fed from the port side. The M-2 machine gun could be fed from either the right or left side. (Lou Drendel)

The plywood ammunition box for the port side nose cheek gun. This was one of a total of 13 M-2 50 caliber machine guns carried on the B-17G. The B-17G could carry a total of 6,380 rounds to feed the 13 machine guns. (Lou Drendel)

One of the most famous B-17s was the Memphis Belle B-17F (41-24485). It was the first Fortress to complete 25 combat missions over the Reich and shared hero status with its crew when it returned to the United States. It resides today on Mud Island in Memphis.

Forward crew access into the aircraft was through this hatch on the lower left side of the nose. The hatch on Memphis Belle carries the word STUKA in yellow.



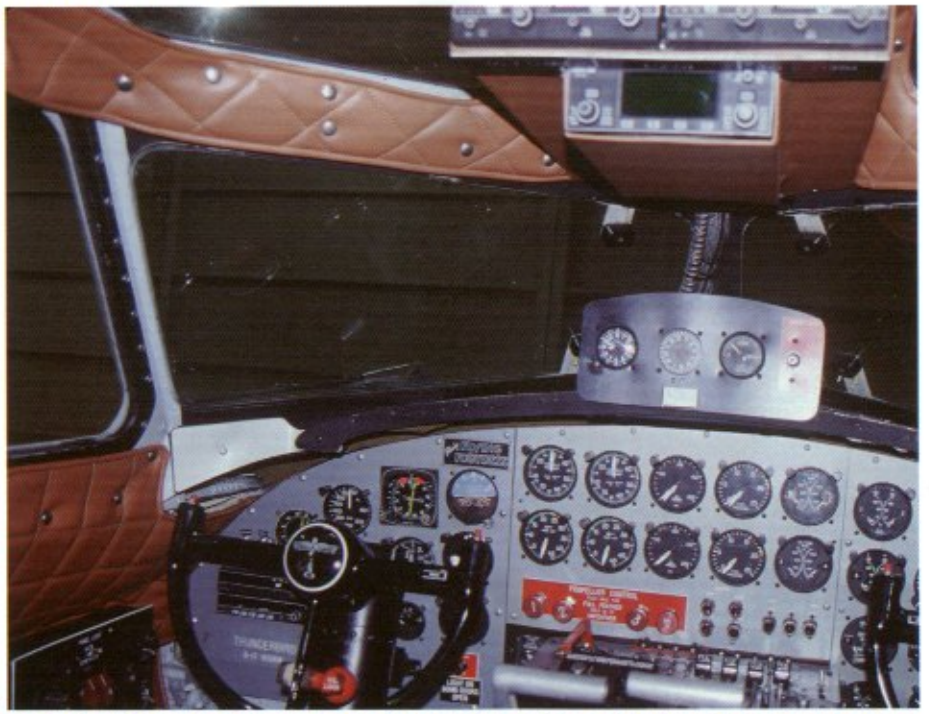
The center console of the B-17G. The large silver levers control engine power while the shorter brown knobs control propeller pitch. The panel below these controls is the Automatic Flight Control Panel. The red handles at the bottom of the photo lock the elevator and rudder (left) and the tail wheel (right). (Lou Drendel)

A newly-manufactured B-17G-40-VE, serial number (42-97991), enroute. The waist gun positions have been sealed to decrease drag and retain heat during the long ferry flight. (Norm Taylor Collection.)

A B-17G-80-BO (43-48111) taxies at Boeing Field, Seattle for a September 1944 service acceptance flight. The average cost of a B-17G at this time was $204,370 but mass production got the final price down to $187,742. (Norm Taylor Collection.)

The cockpit center console. The rudder trim wheel is at the bottom of this console, and the elevator trim wheel is on the left side of the console. The elevator and rudder lock is engaged and the tail wheel is locked (Red handles). (Lou Drendel)

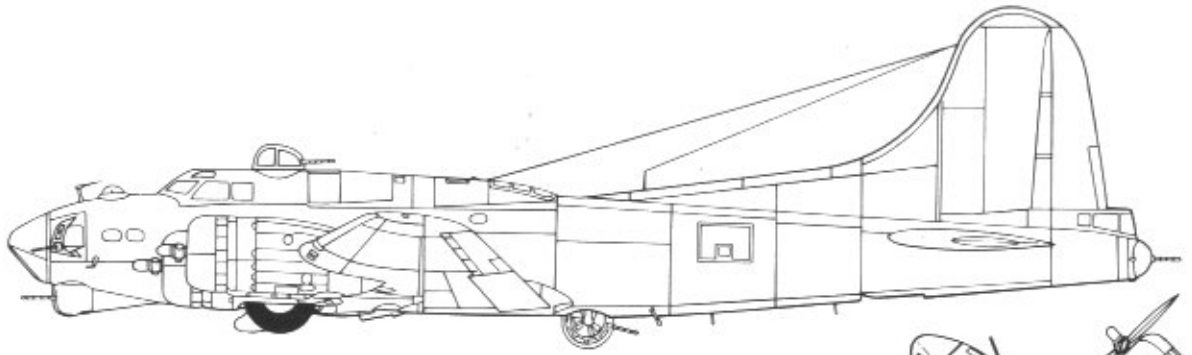
The instrument panel of the EAA B-17 is a mixture of old and new. Modern avionics are conspicuous and necessary, since the EAA conducts regular cross-country tours with its Flying Fortress. (Lou Drendel)

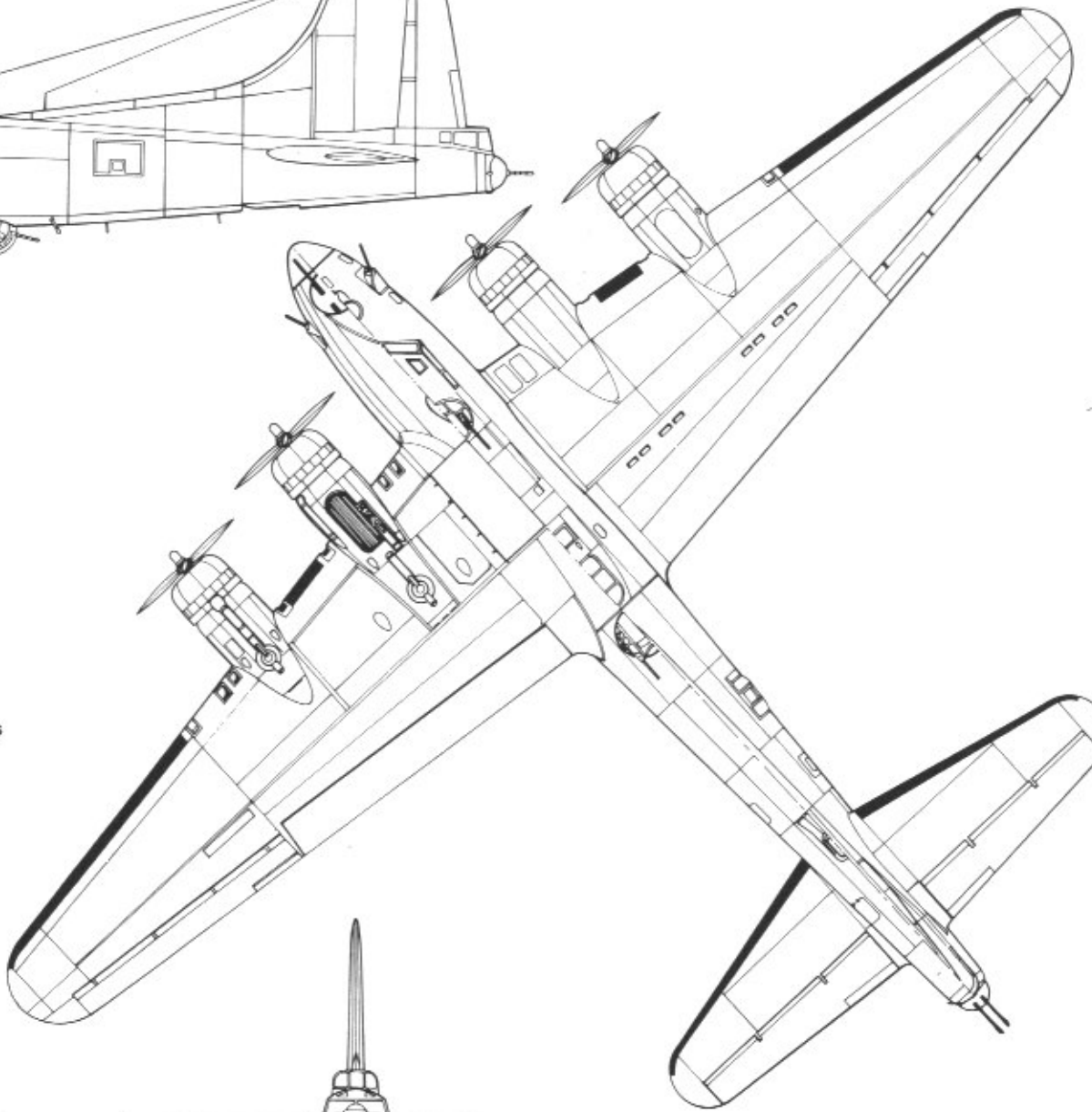


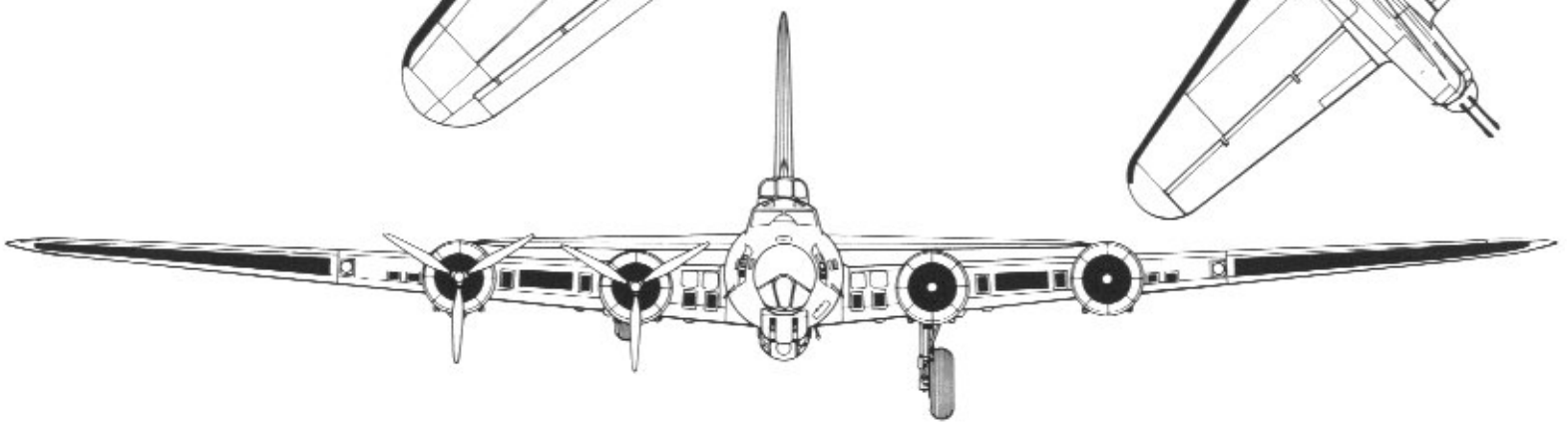
The Lone Star Flight Museum B-17G THUNDER BIRD has a completely modernized panel, which in no way resembles the original. Just to make sure no one mistakes this for a period restoration, they have also upholstered many areas of the interior! (Lou Drendel)

While the interior restoration is not accurate, the markings of THUNDER BIRD are authentic, including the flat paint and variations in color caused by fabric-covered control surfaces. (Lone Star Flight Museum)

B-17G-30-DL (42-38091), was one of 2,395 manufactured by Douglas. Over 400 changes were made to the B-17E to achieve B-17F standard. The B-17G incorporated all of these and added the chin turret. (Boeing via Norm Taylor Collection.)







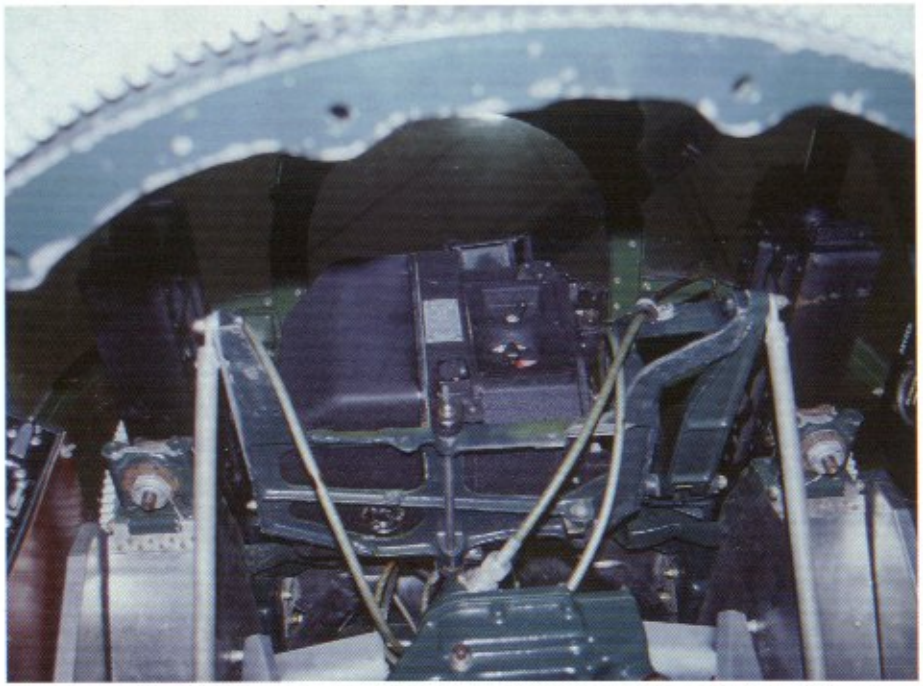
Specifications

Wing Span:...103 Feet, 9 3/8 Inches
Length:.....74 Feet, 3 9/10 Inches (w/Cheyenne Turret)
Height:.....19 Feet, 2.44 Inches
Powerplants: 4 x Wright R-1820-97 Cyclone w/ 1000 hp @ 2300 rpm @ 25,000 Feet
Empty Wt:.....36,134 lbs
Gross Wt:.....40, 260 lbs
Cruise Speed:160 mph
Top Speed:.....315 mph
Ceiling:.....36,400 Feet
Crew:.....10
Bomb Load:.....Up to 6 x 1600 lb bombs or 2 x 4000 lb bombs
Armament:.....12 .50 caliber machine guns

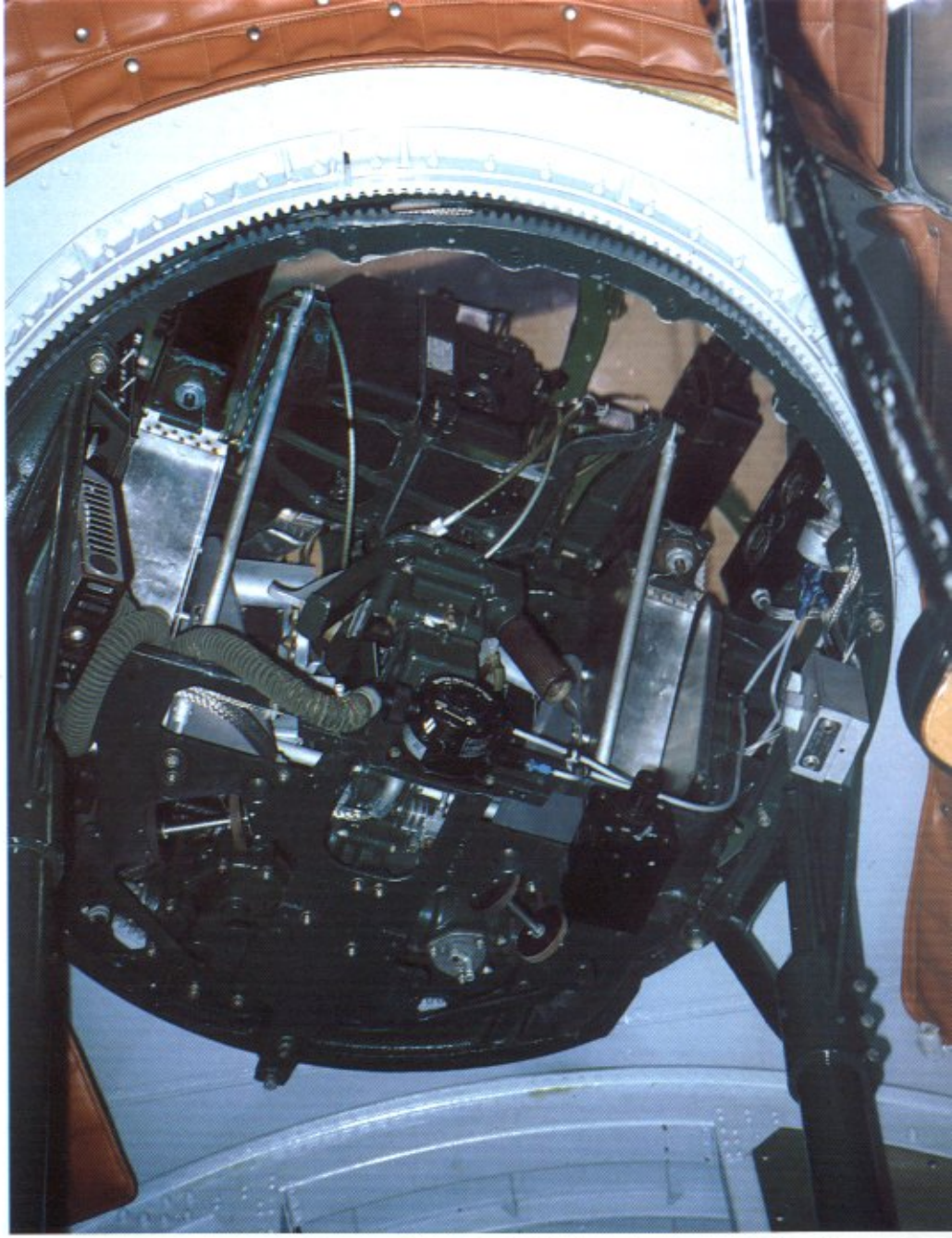
The Pilot's seat with its plywood backing and attached map case. The white inverted "V" below the map case is a bungee strap used to assist in raising the seat. (Lou Drendel)

Co-pilot's seat and support structure in the B-17G. The passage to the nose compartment is at lower left. (Lou Drendel)

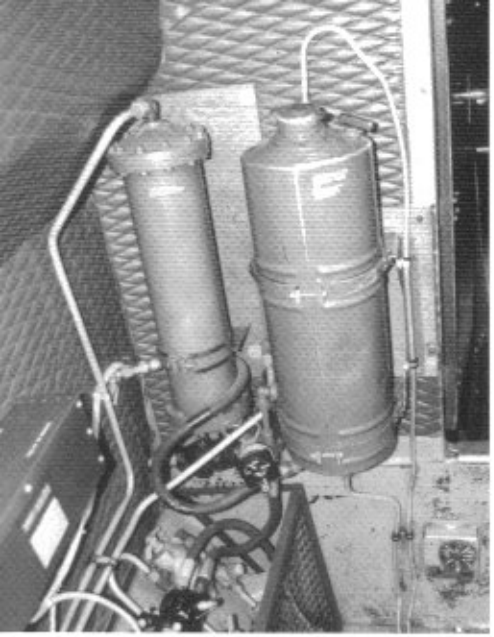
The top turret of the B-17F had a heavier and more complicated series of glazing supports. The 'towel bar' antenna under the turret is a modern VOR receiver and indicates that this is a flying restoration.



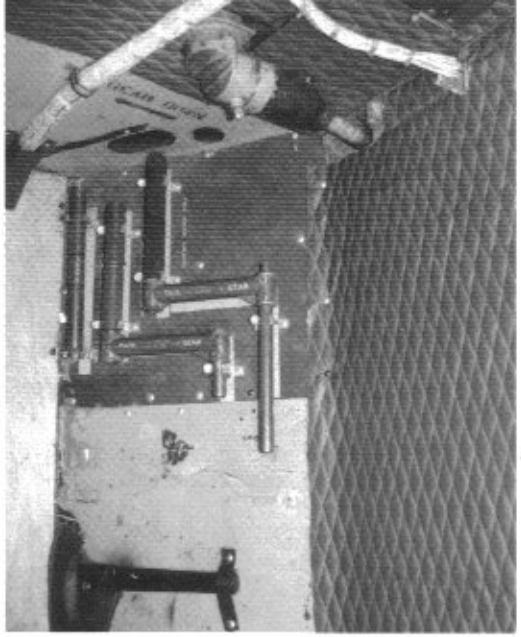
Top turret gunsight. The guns were elevated by rotating the hand grips up or down, and the turret was traversed by rotating the grips left or right. The gunner rested both thumbs on the range knob between the grips, where he could rotate it to compute the range to the target. (Lou Drendel)



The interior of the top turret of the Lone Star B-17G. Upholstery has been added to the interior of the aircraft as sound-proofing. The hand grips for the guns are in the center of this maze, while the gunsight is just visible at the top (inside the turret). (Lou Drendel)



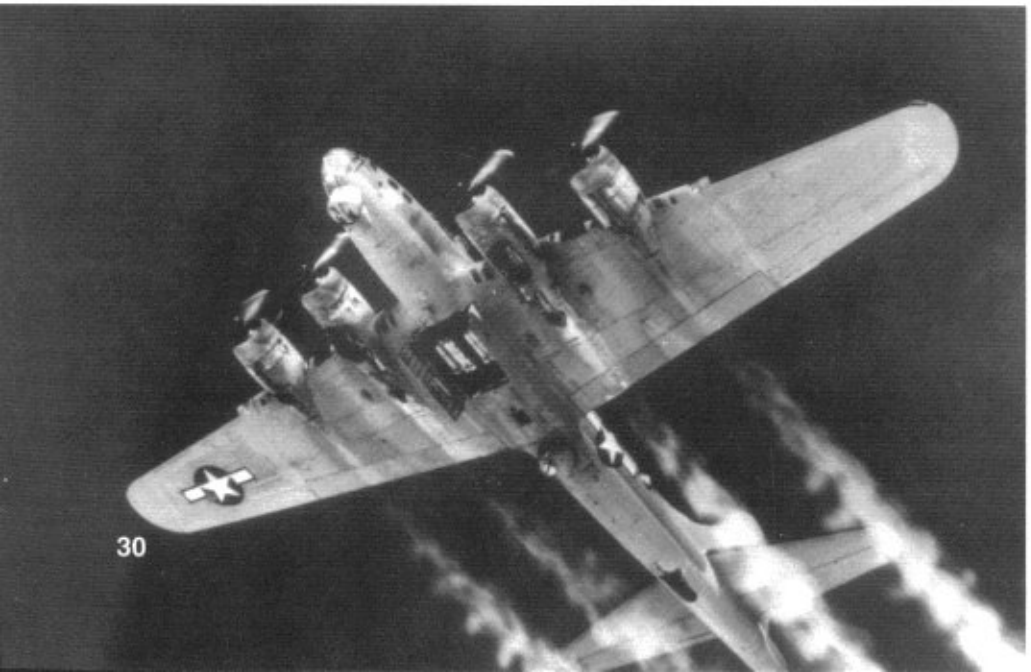
The two cylinders mounted on the starboard rear cockpit bulkhead are the hydraulic accumulator (left) and the hydraulic reservoir (right). (Lou Drendel)



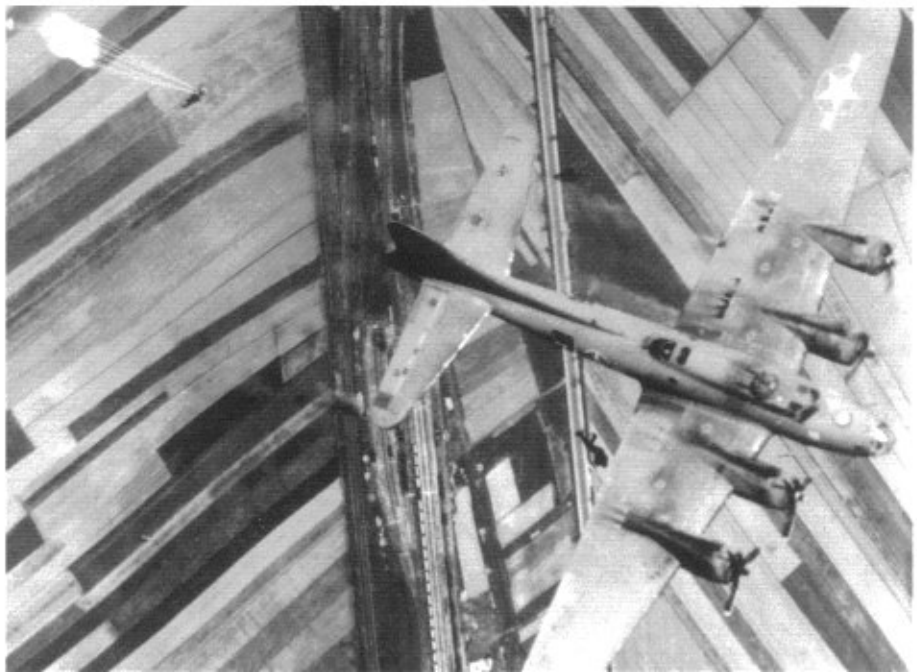
Hand cranks for landing gear and bomb bay door, including additional extensions (stored below cranks) to provide additional leverage for this difficult task. (Lou Drendel)

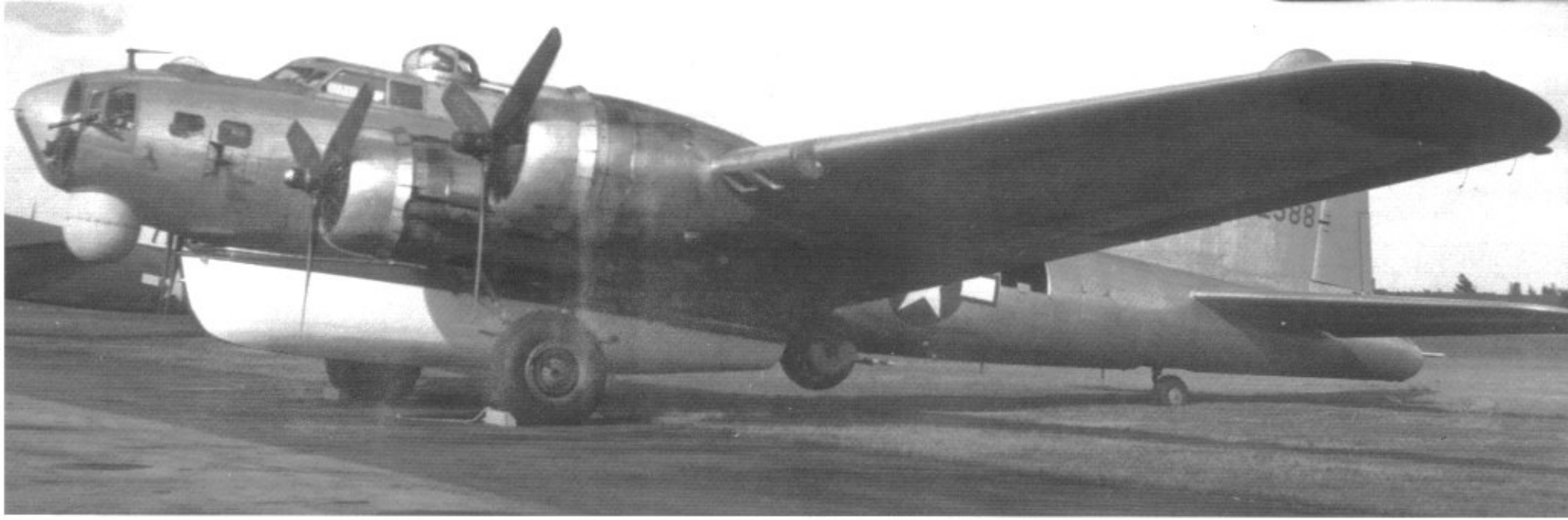
B-17Gs of the 457th Group at Bradley. The 457th flew 237 combat missions in 13 months in the ETO. They were the first group to operate an all-natural metal formation and were known as 'The Silver Group'. (LtCol Mike Moffit via Norm Taylor Collection.)

A B-17G on its bomb run. It is loaded with M-17 Incendiary Cluster Bombs. General Curtis LeMay developed many of the daylight mass bombing tactics of the 8th Air Force, the primary formation of which was a three ship section. Sections were positioned to achieve maximum defensive firepower. The entire formation released its bombs on command from the Lead Bombardier. (Norm Taylor Collection.)



A B-17 in trouble. Both starboard engines are feathered, and the crew has begun to bail out. The primary escape route was through the bomb bay and two crew members have already jumped. The rest of the crew bailed out before the Fortress exploded over Wiener-Neustadt, Austria. (Norm Taylor Collection.)





(Above) SB-17G-55-BO (42-102588). The air-sea rescue modification in the Pacific included the lifeboat and special radar equipment. B-17s were modified to this standard in the field at local modification centers. (Clyde Gerdes via Norm Taylor Collection.)

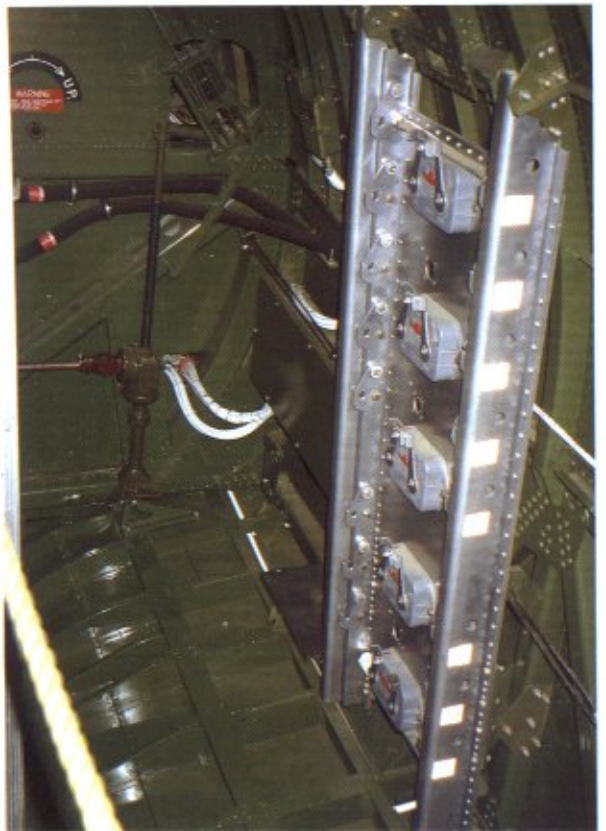
An SB-17G on Okinawa in early 1945. Six SB-17Gs were assigned the task of search and rescue of downed B-29 crews after raids on the Japanese homeland. They operated from Iwo Jima and Okinawa. In the ETO they were known as ALB-17Gs and began operating in March of 1945, dropping life boats to crews of Forts that were forced to ditch in the English Channel or North Sea. They performed the same mission early in the Korean War. (USMC)

Looking upward through the nose entry hatch of the Lone Star B-17G. The cockpit and nose compartment are to the left and the bomb bay is to the right. (Lou Drendel)

The inside of the port bomb bay door was painted chromate green. (Lou Drendel)

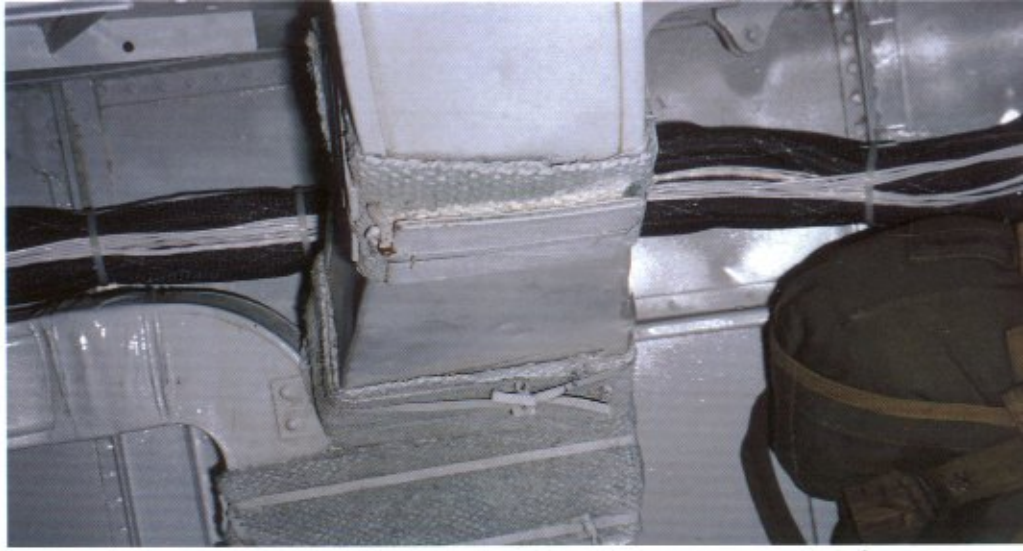
The complex shape of the bomb bay doors is evident when looking aft at the door. The unpainted actuating rod is at the front of the door. (Lou Drendel)

View of bomb bay with the doors closed, looking aft from the catwalk. The bomb rack is the silver structure. The rope in the left foreground is a safety feature on this civilian flying restoration. (Lou Drendel)



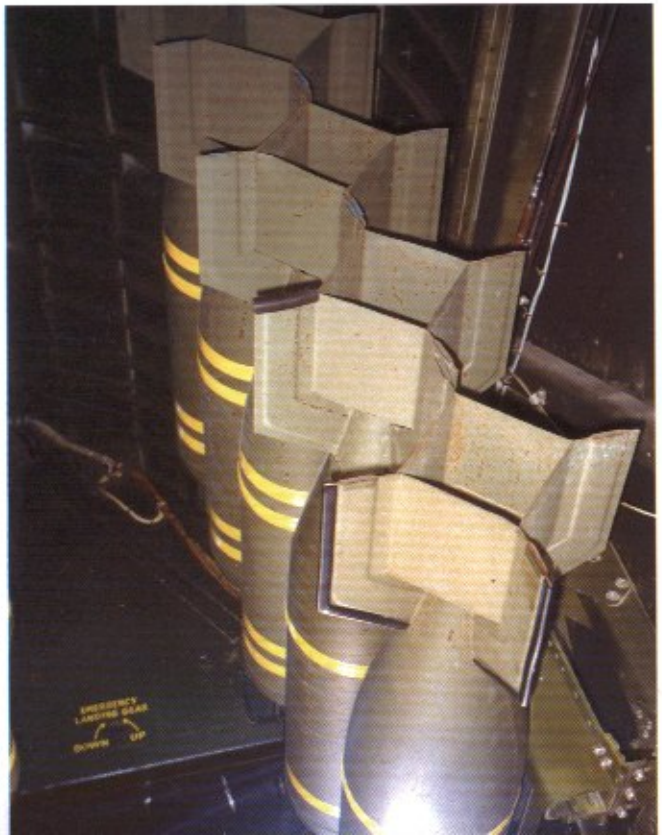
A Bomb rack with the doors open, looking forward. (Lou Drendel)

A bomb rack looking downward, with bomb bay doors open. (Lou Drendel)



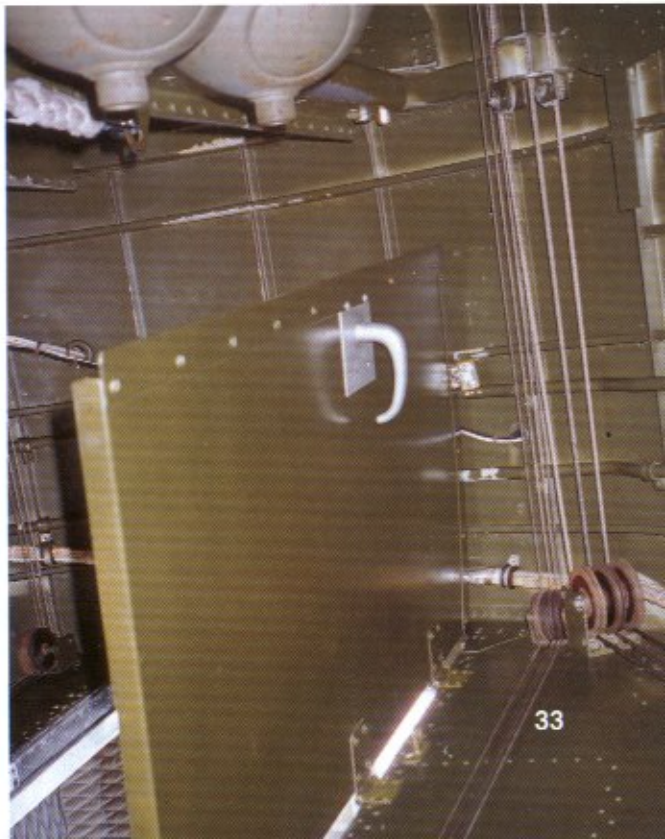
The heat ducting running through the forward fuselage. (Lou Drendel)

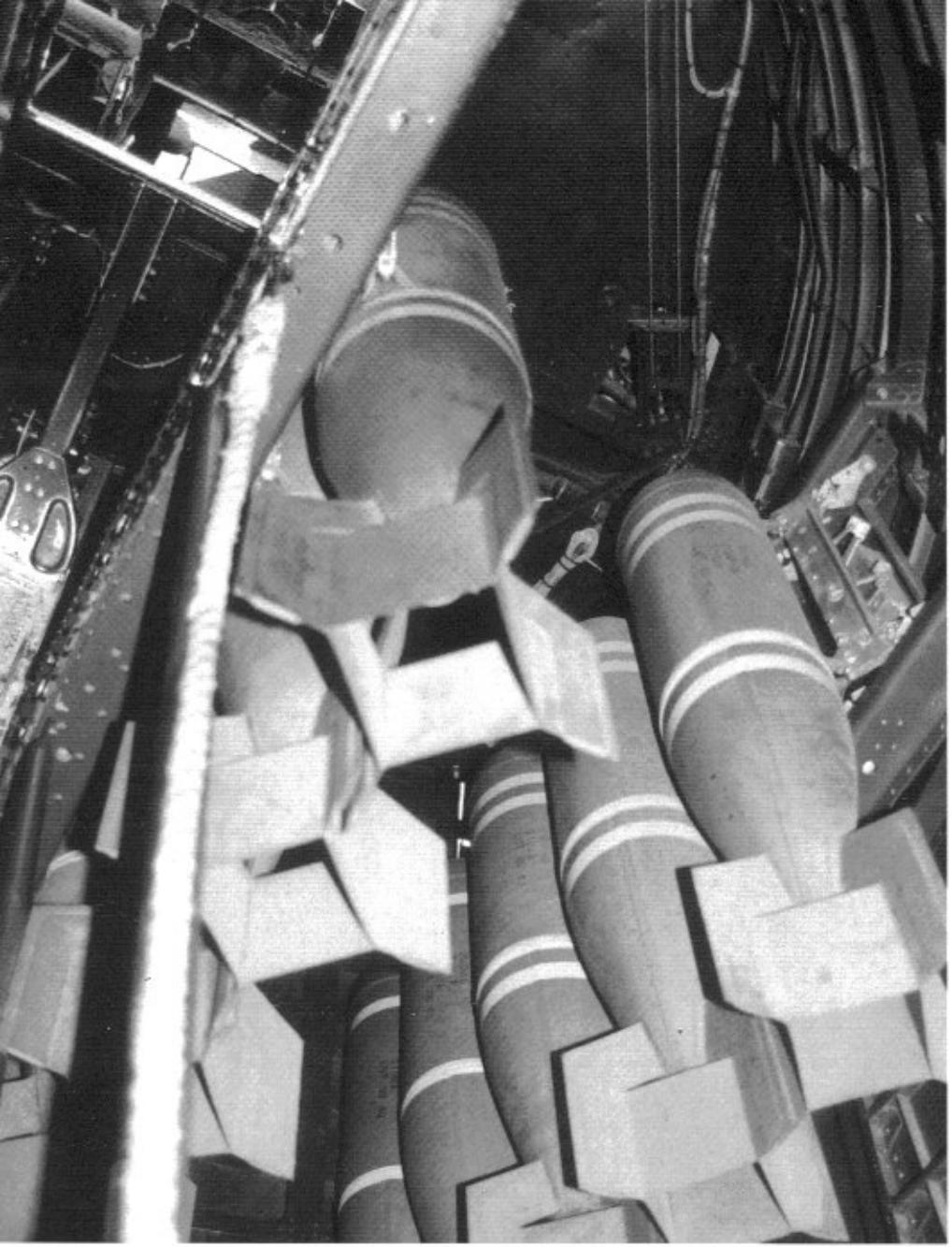
Bombs mounted on the bomb rack, looking forward. The emergency landing gear crank receptacle is at left, and indicated by lettering. The landing gear could be cranked up or down from this position. (Lou Drendel)



Bombs mounted on the inboard bomb rack. There are four racks in the bomb bay, one each on the outboard walls, and two inboard. (Lou Drendel)

View of the bomb bay, looking upward. The door at left, which leads forward to the cockpit is open. (Lou Drendel)



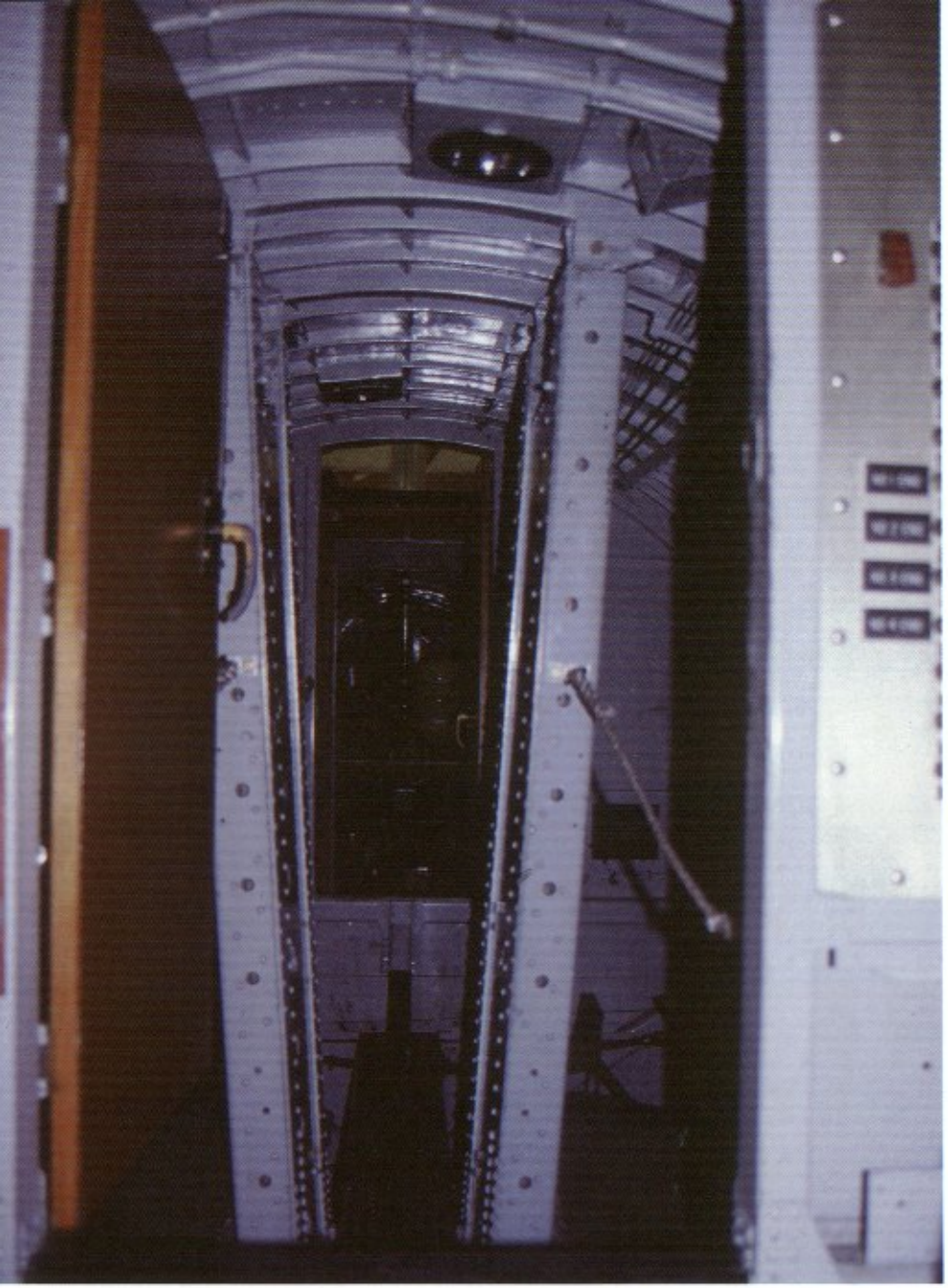


View from catwalk between bomb racks, looking forward. The normal bomb load for long range missions was 4,000 lbs. (Lou Drendel)

HITLER'S HEADACHE was a B-17G-105-BO (43-39180) of the 600th Bomb Squadron, 398th Bomb Group at Bradley Field in May of 1945. (LtCol Mike Moffit via Norm Taylor Collection.)

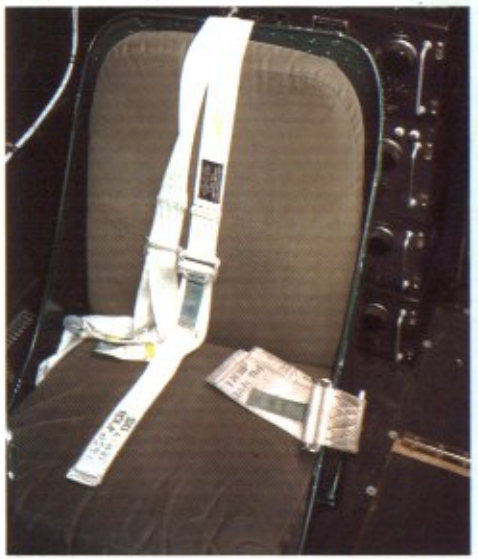
The crew of HITLER'S HEADACHE shortly after its arrival at Bradley Field. It flew it's first combat mission on 6 May 1944, from Nuthampstead, England. (LtCol Mike Moffit via Norm Taylor Collection.)

(Above and Below) B-17G-65-VE (44-8485) of the 100th Bomb Group in France during the Fall of 1944. It has been modified by removal of the ball turret with the addition of a retractable H2X radome in its place. The H2X ground-mapping radar enabled B-17s to bomb through cloud cover. The radar operator sat in the radio room. (Norm Taylor Collection.)



Looking aft through the bomb bay toward the radio compartment. The narrow catwalk and "V" shape of the inboard bomb racks are evident. (Lou Drendel)

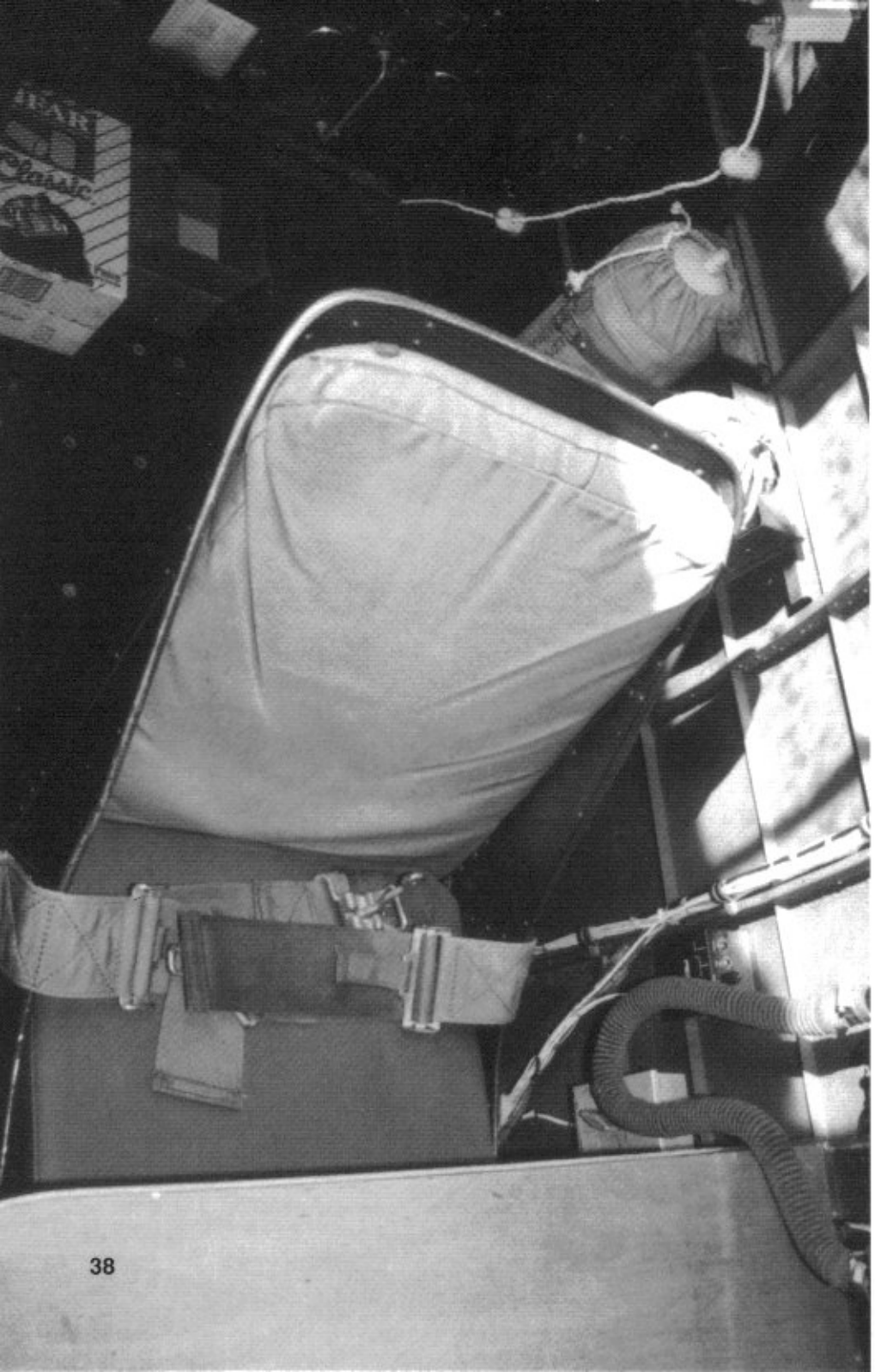
The window of the radio compartment is on the starboard side of the fuselage. In early versions of the B-17, the radio operator had a 50 caliber machine gun mounted in the rear ceiling of the compartment. It was removed in the latest versions of the B-17G

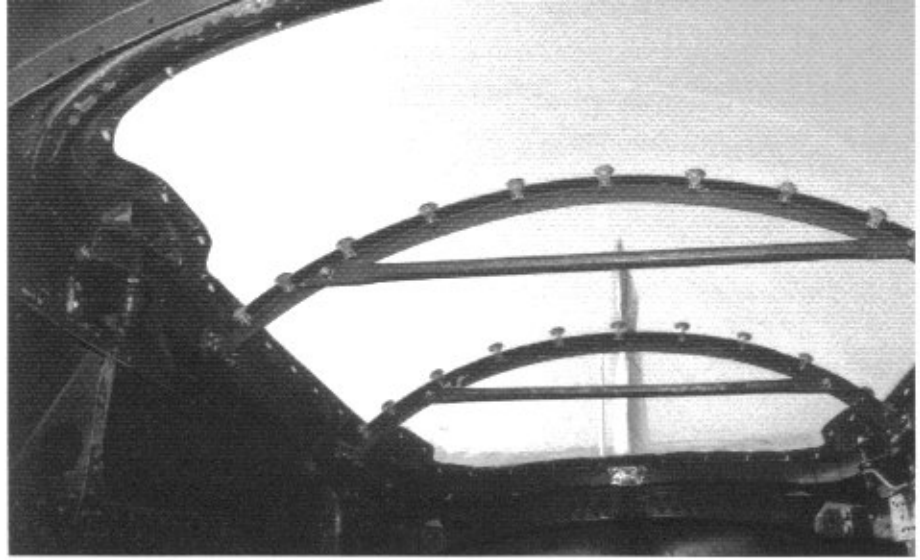


Radio equipment mounted on the port side against the rear bulkhead included antenna and transmitter tuning units and the liaison transmitter. (Lou Drendel)

The starboard rear bulkhead mounted transmitter tuning units (boxes) and hand cranks for bomb bay and landing gear emergency extension (on bulkhead above boxes). One of these radio sets was the SCR-518-A, which determined the height of the airplane over the ground. This was not a barometric device, and measured altitude above the highest obstacle. It was reliable up to 20,000 feet, and worked satisfactorily up to 30,000 feet. (Lou Drendel)

The Radio Operator's station. The SCR-287-A Liaison radio set occuples the prominent position on the table. Both of these civilian flying restoratlons are missing several other pieces of equipment from this posltion. The radio compartment was directly aft of the bomb bay and forward of the waist gunners compartment. (Lou Drendel)

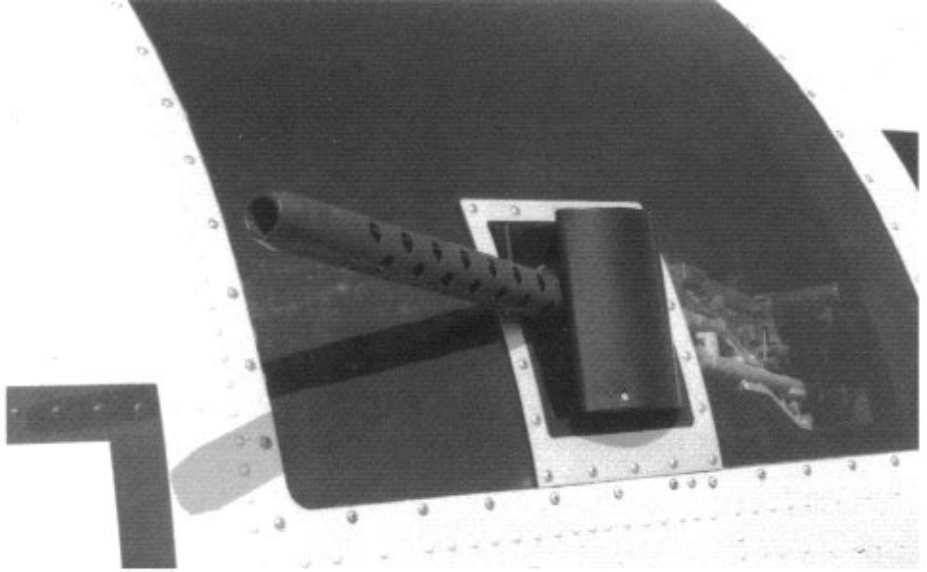




(Above) The top window of the radio compartment on a late model B-17G provided excellent light for the position. Earlier models mounted a 50 caliber machine gun in this window. (Lou Drendel)

(Left) The radio operator's seat and seat belt. The oxygen hose is mounted on the wall to the left of the seat. (Lou Drendel)

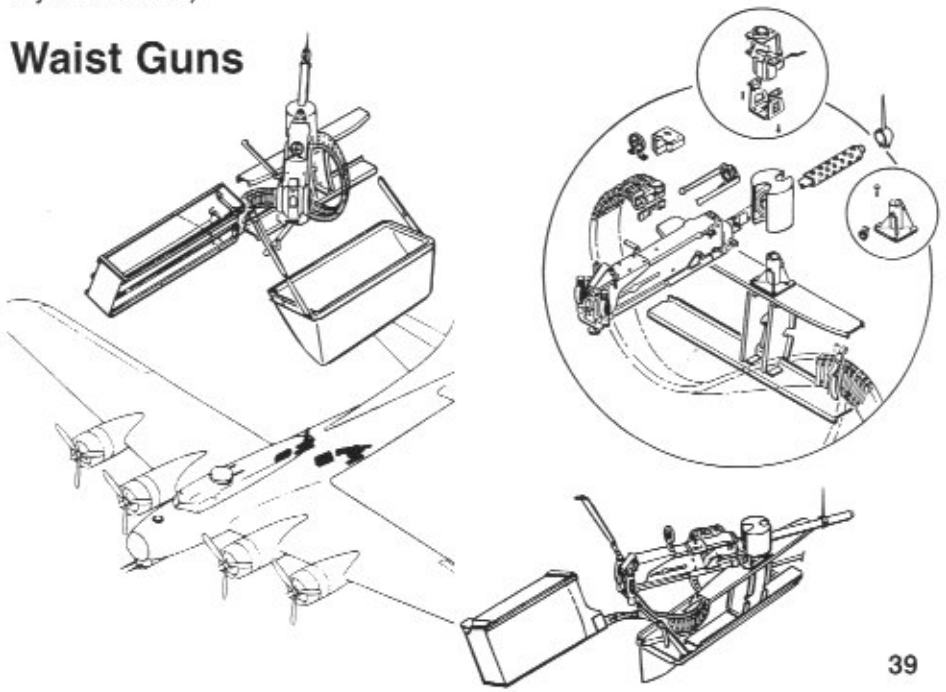
(Below) B-17G-20-DL (42-37969) of the 532nd Bomb Squadron, 381st Bomb Group. The 381st Group had the unlucky distinction of suffering the heaviest losses on the Schweinfurt mission of 17 August 1943, 11 of 26 Forts failed to return. The 381st flew combat until April of 1945, and was disbanded on 28 August 1945. (Norm Taylor Collection.)

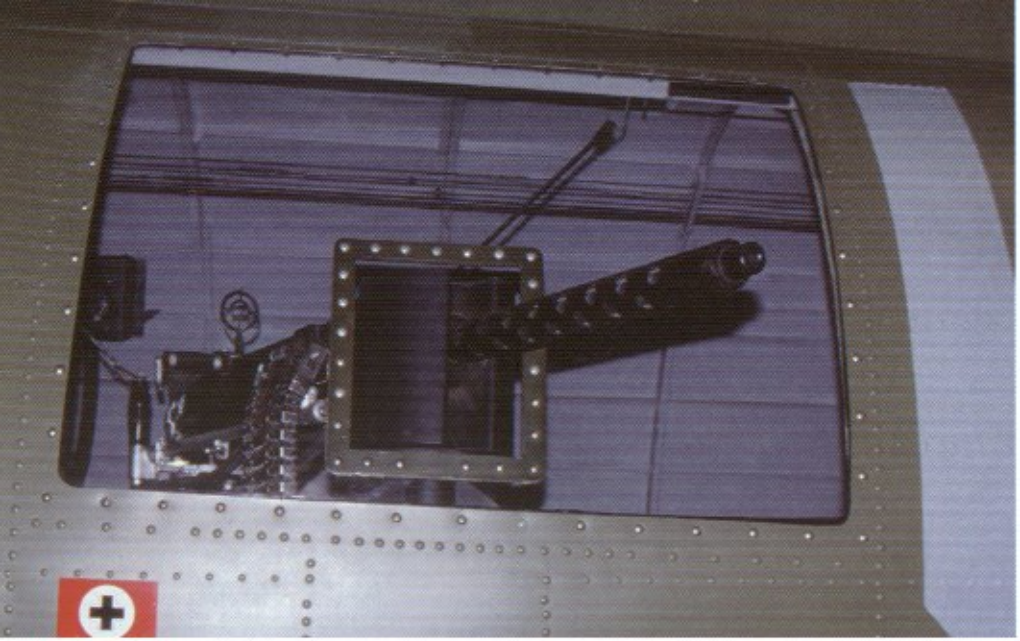


(Above) The waist gun mount on the B-17G. Early models of the Flying Fortress had the waist guns mounted on pedestals in an open window. This made for brutal conditions at 20,000 plus feet where temperatures were often -50° F. (Lou Drendel)

(Left) The waist gunners compartment looking aft. Early versions of the B-17 had the gun positions directly opposite each other which made it difficult for the waist gunners to maneuver. Later versions staggered these positions. The waist gunners had individual controls for heated suits, oxygen, and interphone controls. (LtCol Mike Moffit via Norm Taylor Collection.)

Waist Guns

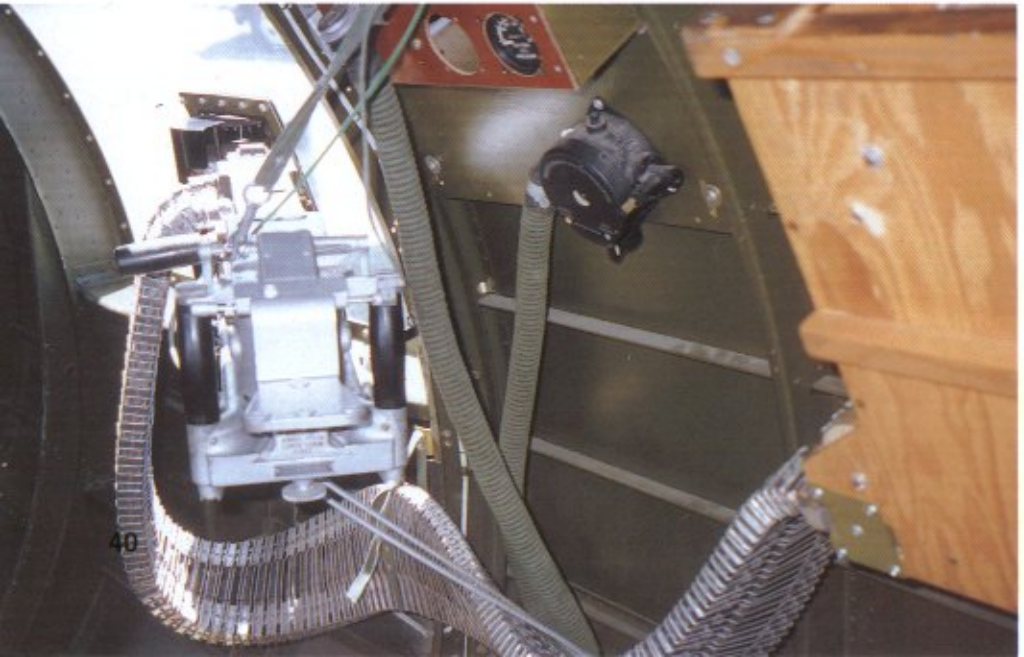


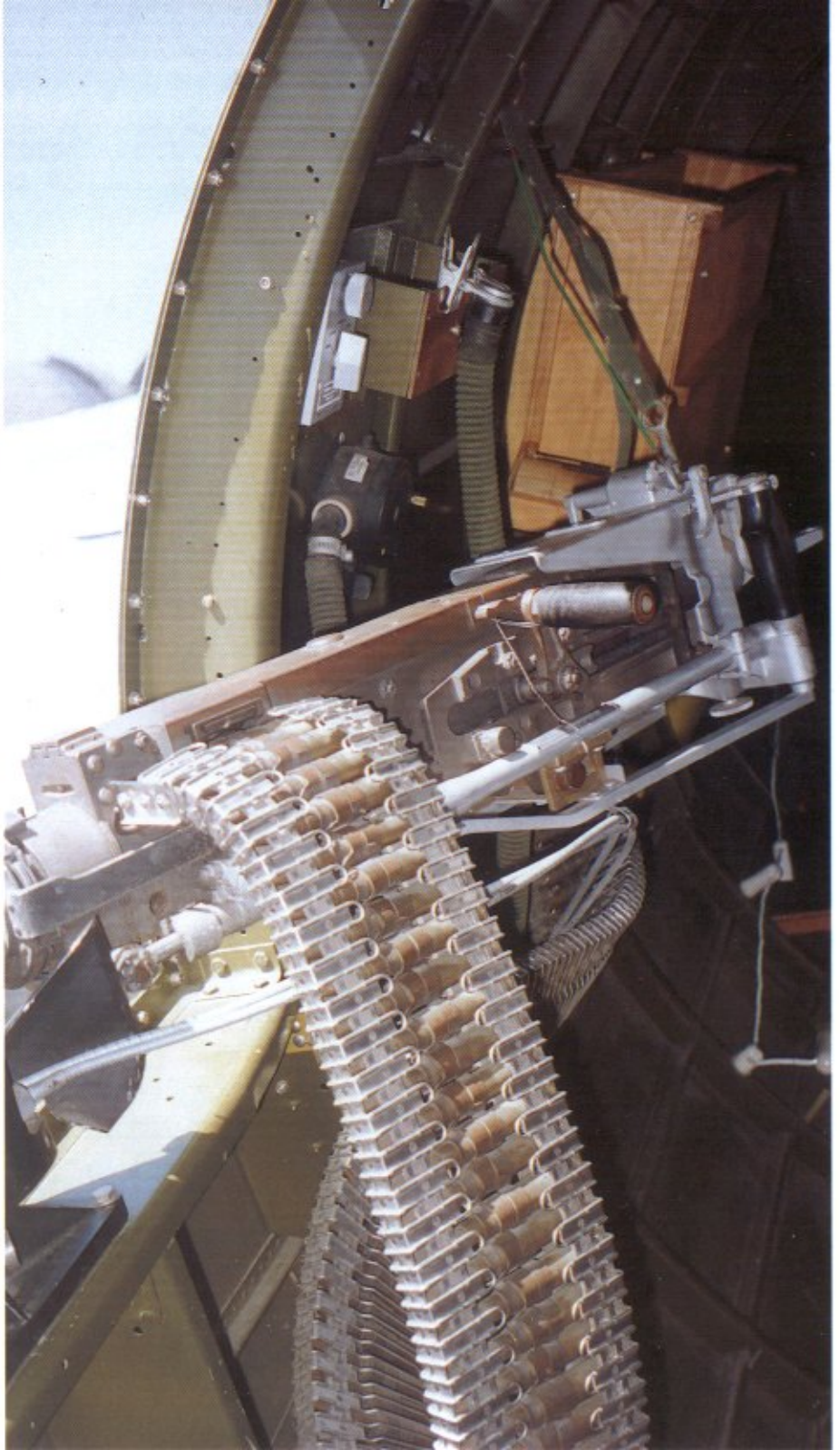


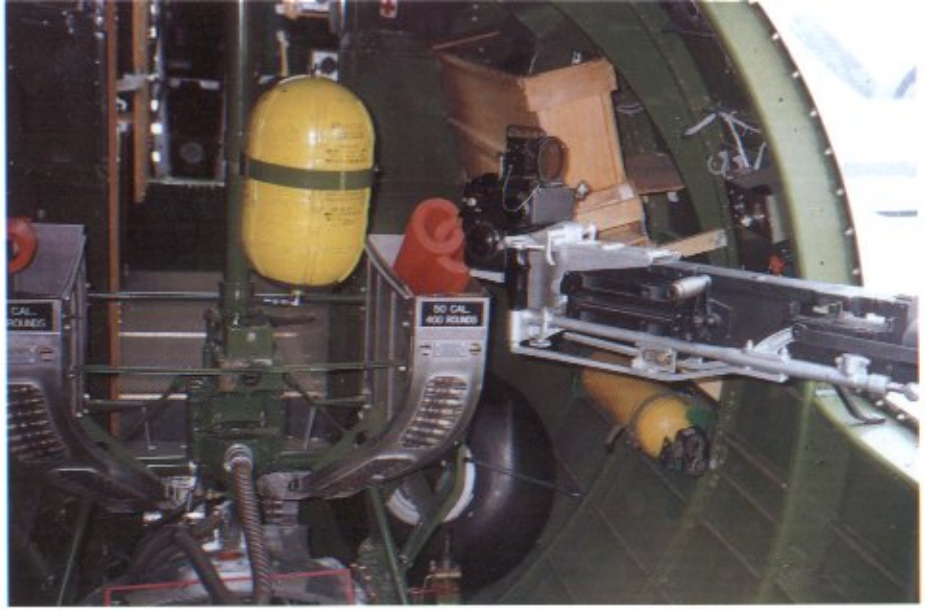
A late model B-17G starboard waist gun installation. The internal gun support cables are visible. (Lou Drendel)

(Right) The Browning M-2 .50 caliber was the most produced U.S. machine gun in WWII. It was first produced in 1921 as an enlarged version of the M1917A-1 .30 caliber machine gun. (Lou Drendel)

Waist gun ammunition feed belt. The M-2 Machine gun could be fed ammunition from either the left or right side. The hose is the oxygen feed for the left waist gunner. (Lou Drendel)





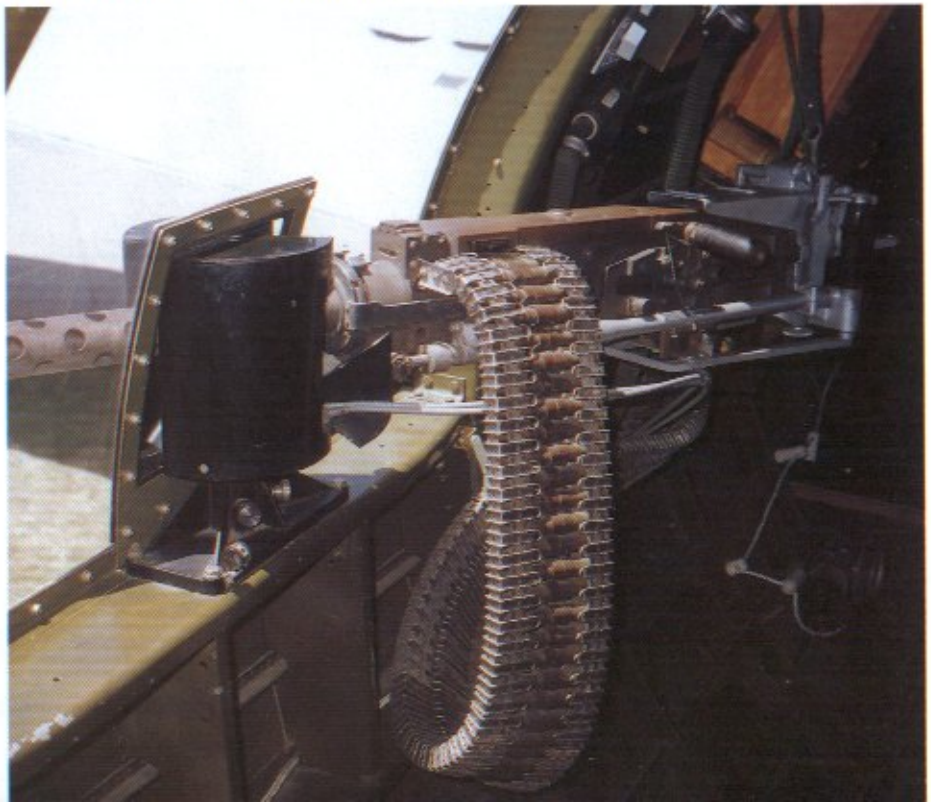


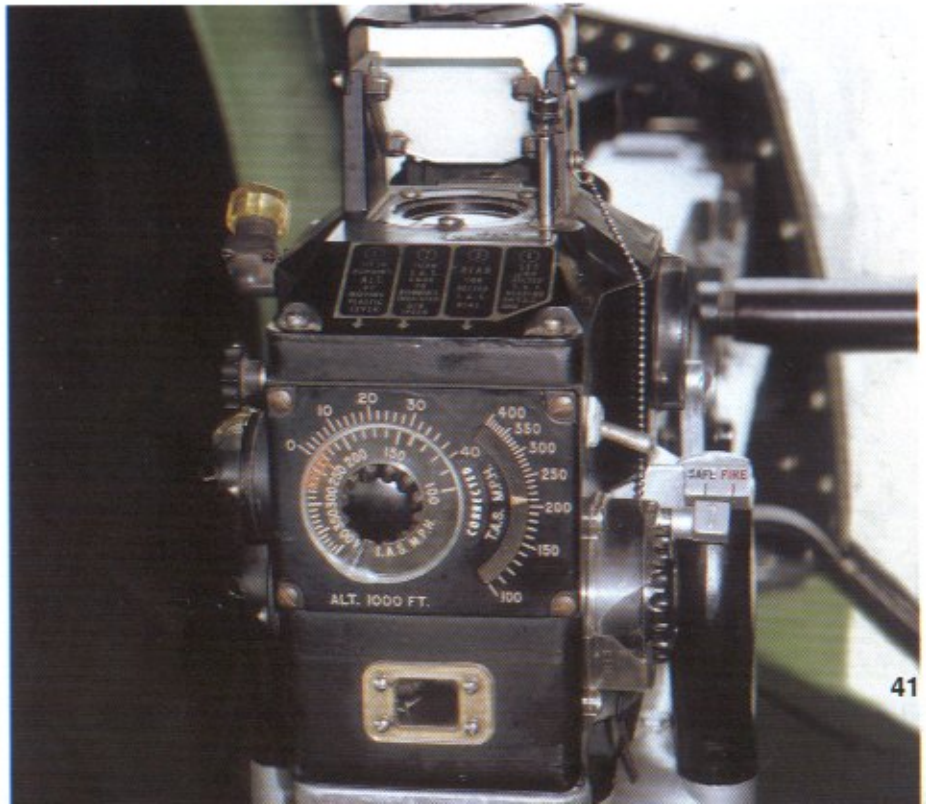
Late model B-17s had a lead computing sight installed on the waist guns. The yellow oxygen bottle is for the ball turret gunner. (Lou Drendel)

The lead computing gunsight on the M-2 machine gun was mounted at the rear of the gun breech. (Lou Drendel)

The M-2 machine gun was 57 inches long, weighed 64 lbs., had a maximum range of 7,200 yards, and an effective range of 1,200 yards. It fired 800 rounds per minute at a muzzle velocity of 2,750 feet per second. (Lou Drendel)

The settings on the K-series lead computing gunsight. The gunner set the true airspeed of the B-17, along with the altitude. The sight reticule moved to compensate for relative speed and angle off of the target. (Lou Drendel)

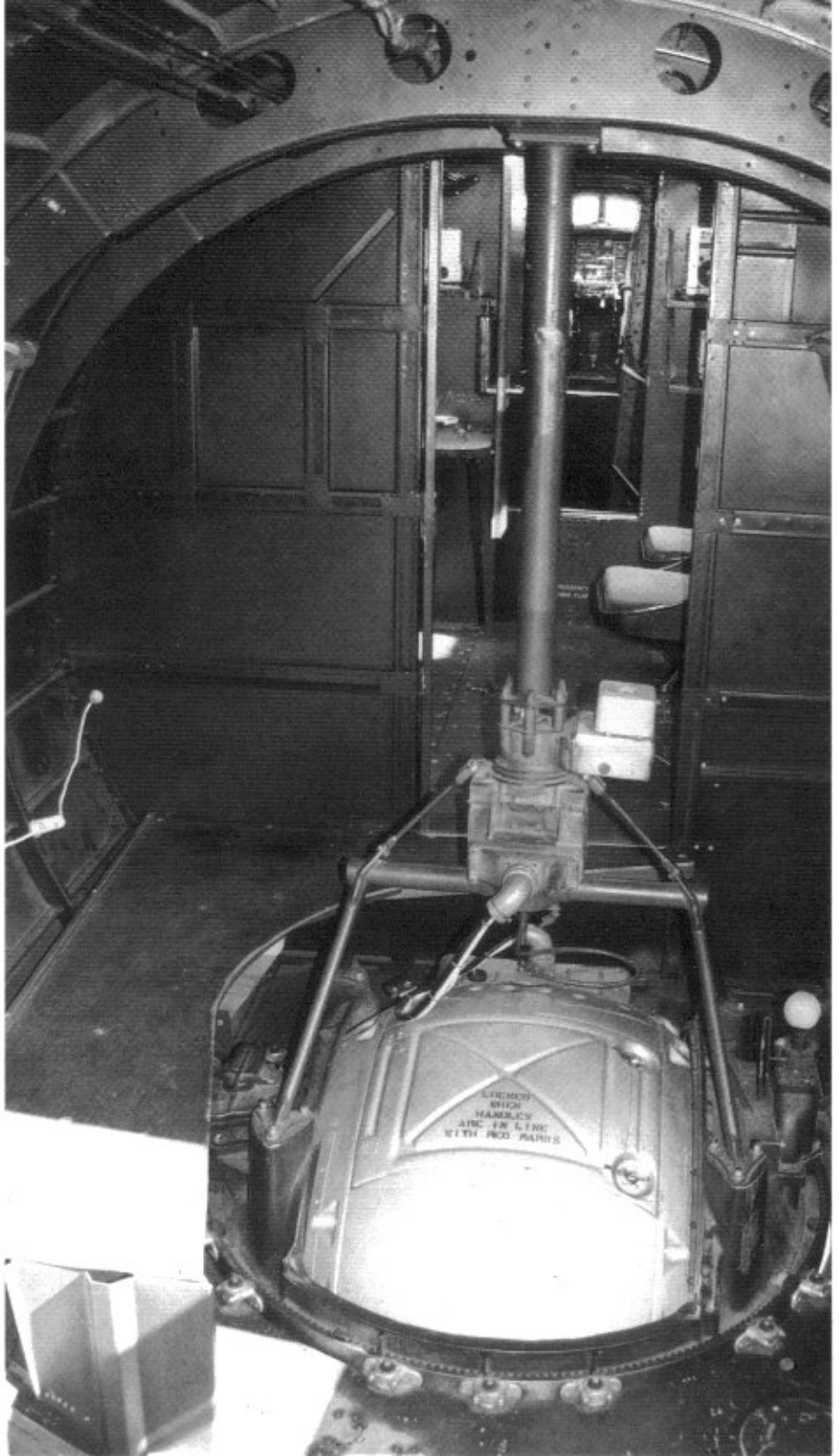


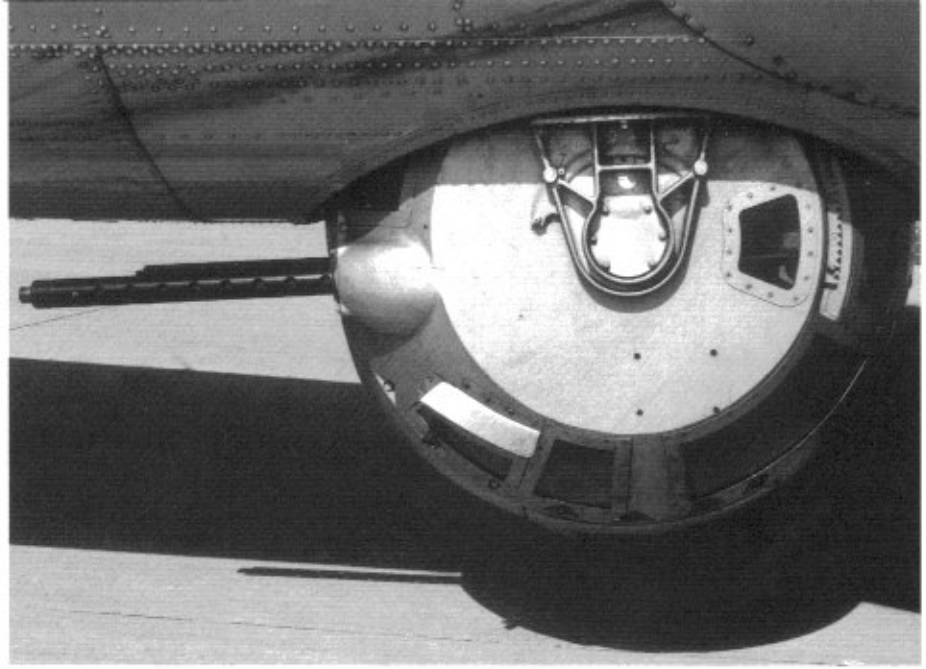


(Above) The rear of the ball turret, looking aft. The entry door is centered in the rear of the turret. The Sperry ball turret was installed on every B-17 produced, from aircraft number 113 until the end of the production run. (Lou Drendel)

(Right) The ball turret from inside the waist gunners compartment, looking forward towards the radio room. The turret is driven through azimuth and elevation by hydraulic power. (Lou Drendel)

(Below) The business end of the Sperry ball turret looking forward. (Lou Drendel)



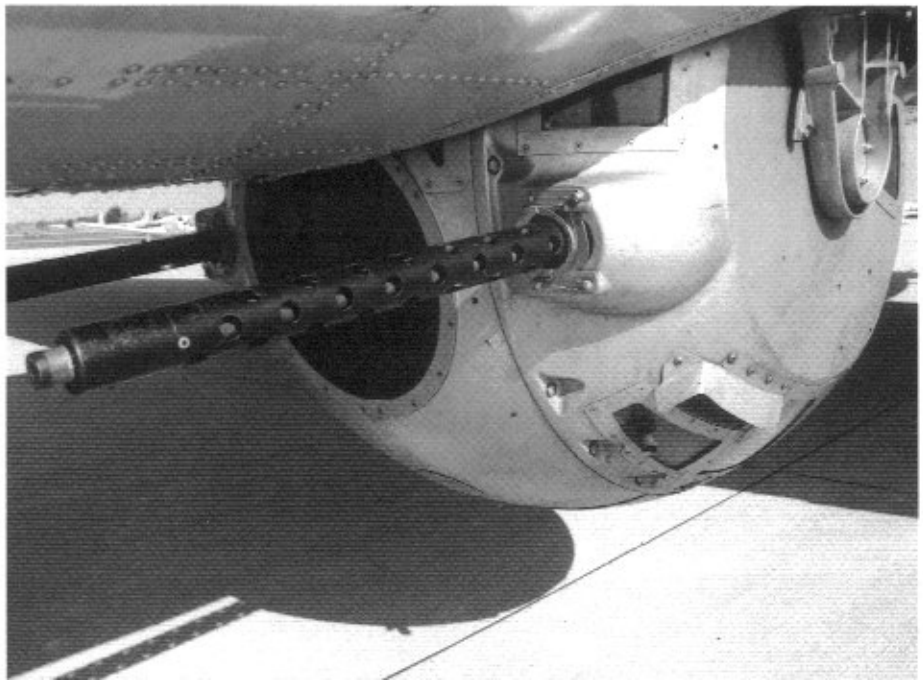


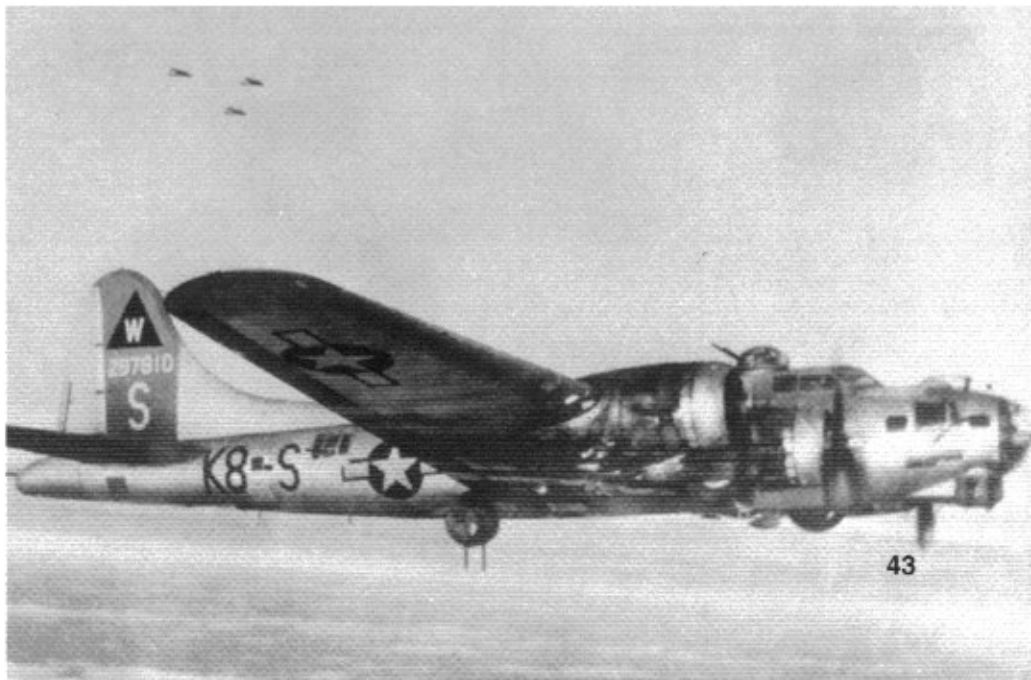
Sideview of the Sperry ball turret. Limited visibility required crew coordination in calling out enemy fighters in order to make the ball turret an effective defensive weapon. (Lou Drendel)

B-17G-35-BO (42-32095) of the 322nd Bomb Squadron, 91st Bomb Group, carried name ACK-ACK ANNIE. The 91st Wing was based at Bassingbourne, England. It was one of the most famous of the 8th Air Force bomber units. (Norm Taylor Collection.)

The ball turret is stowed in this position for takeoff and landing. The gunner entered the ball turret after the B-17 was airborne. Entering the turret was a complicated, 9-step process. The turret was an isolated existence for the gunner, who was only linked to the airplane by the interphone and the flight suit heater. (Lou Drendel)

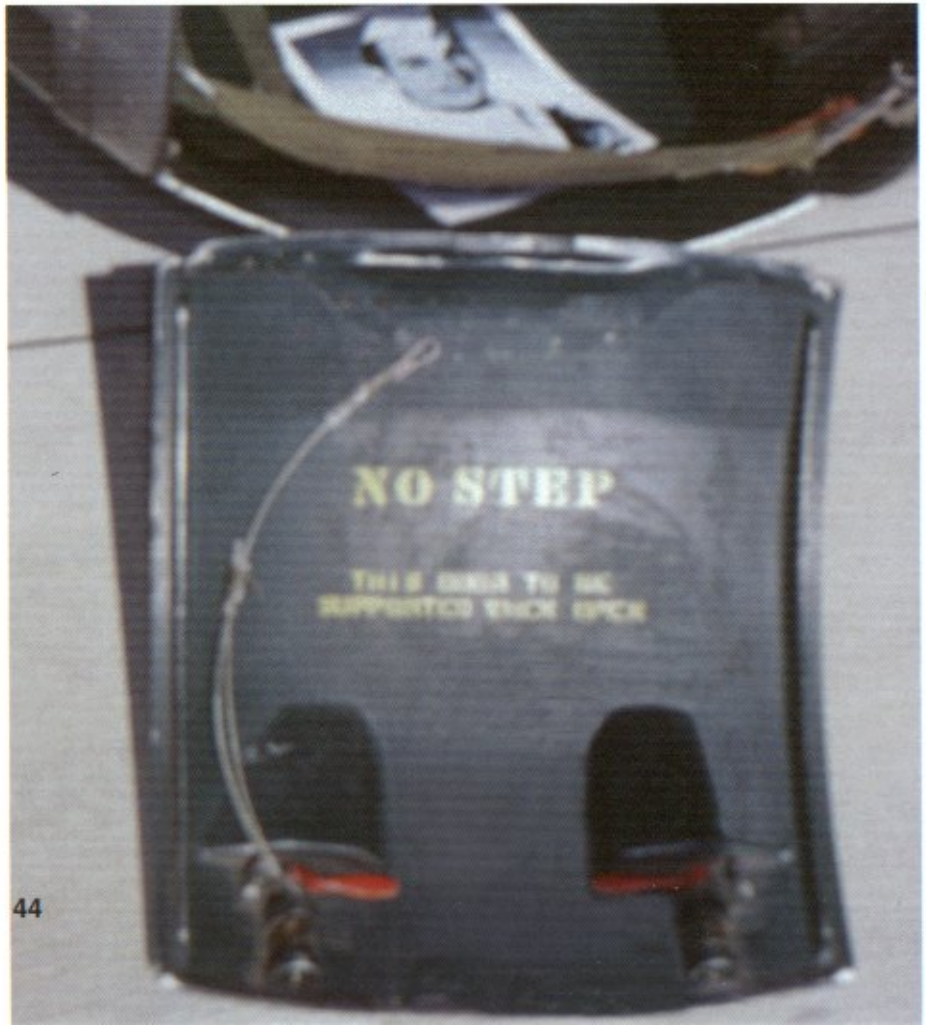
B-17G-30-VE (42-97810) of the 602nd BS, 398th BG with its guns pointing downward gives the Fortress a tired look. (Norm Taylor Collection.)





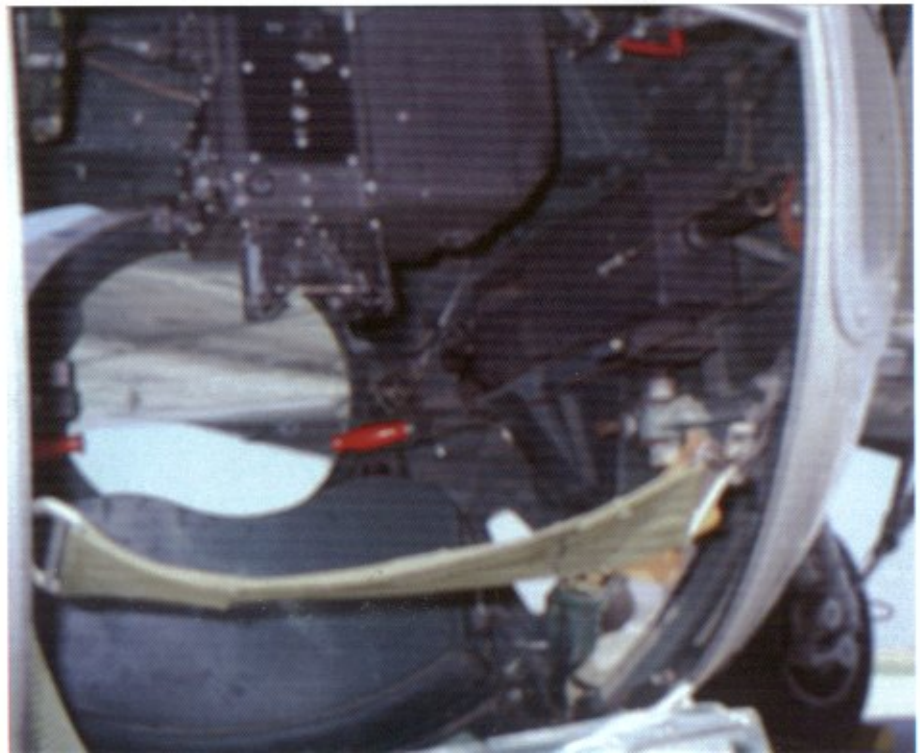
The waist gun position window of "Shoo Shoo Shoo BABY", predates the clear, unrestricted view windows of later model B-17Gs. (David F. Brown)

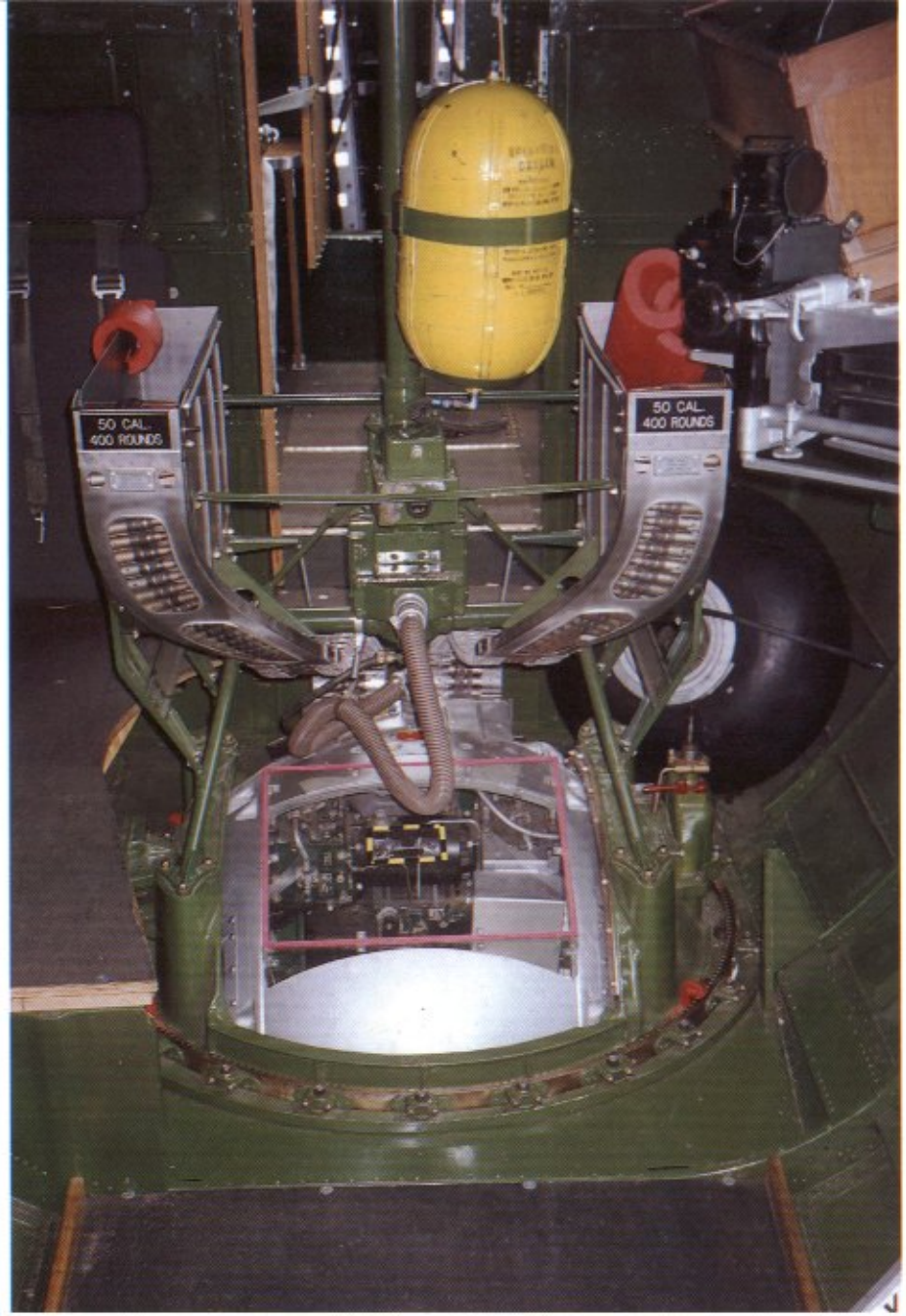
The open entry door of the ball turret. The red handles lock the door in flight. A photo of the WWII occupant of this ball turret is carried as a tribute. (Lou Drendel)



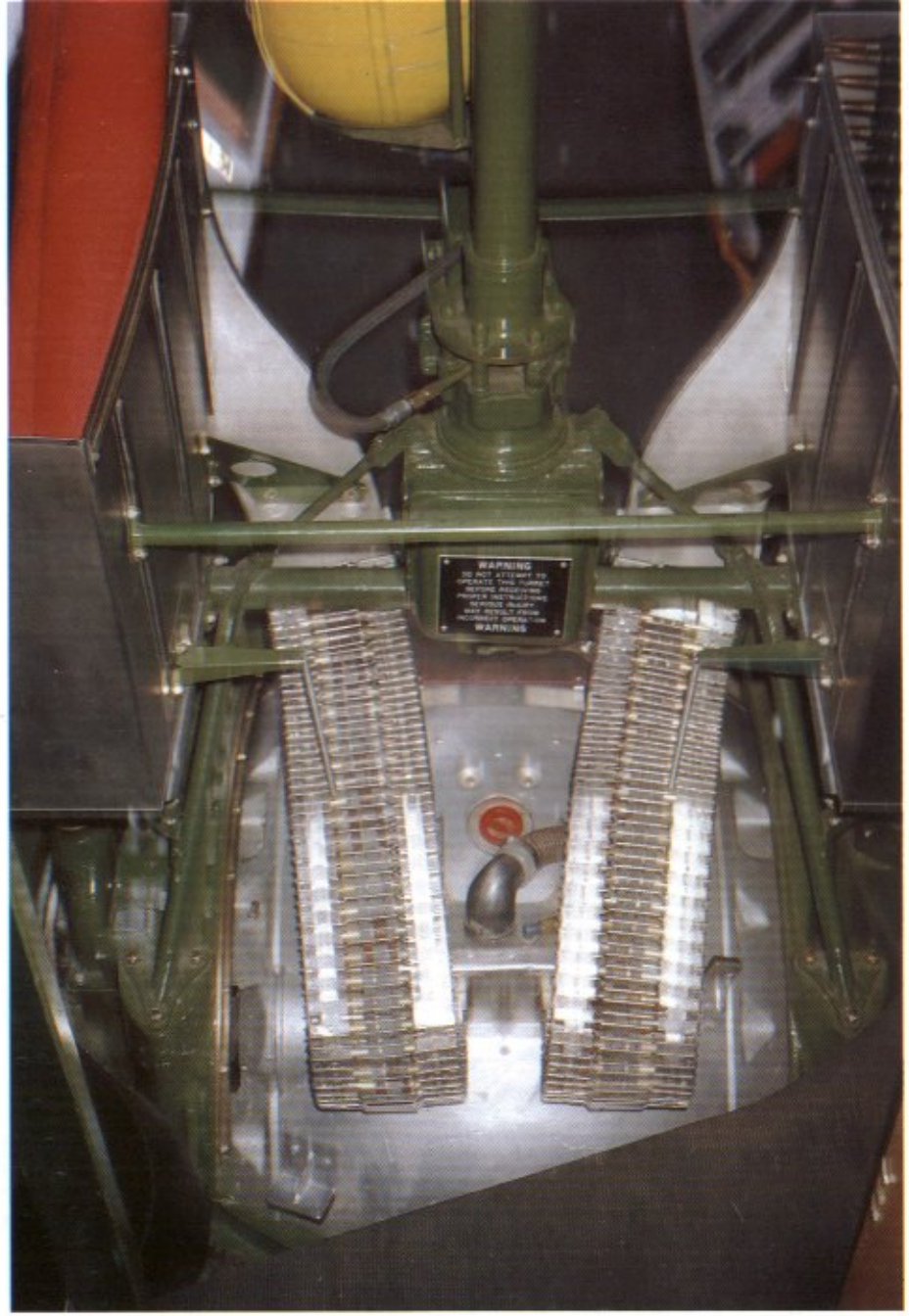
Looking into the ball though the open entry door. The red handles are for charging the machine guns. One of the guns can be seen on the left. The ammunition belt feeds from the outside of each gun, with the empty shell casings being ejected out the bottom. (Lou Drendel)

The gunsight can be seen at the top of the photo. The right heel rest is just visible behind and to the right of the gunsight. (Lou Drendel)





Looking forward at the ball turret inside the fuselage. The yellow bottle is oxygen. The aluminum ammunition boxes are in place, with belts of ammo being fed into the turret. The rear of the turret was armored, affording protection to the gunner from 30 caliber bullets. (Lou Drendel)



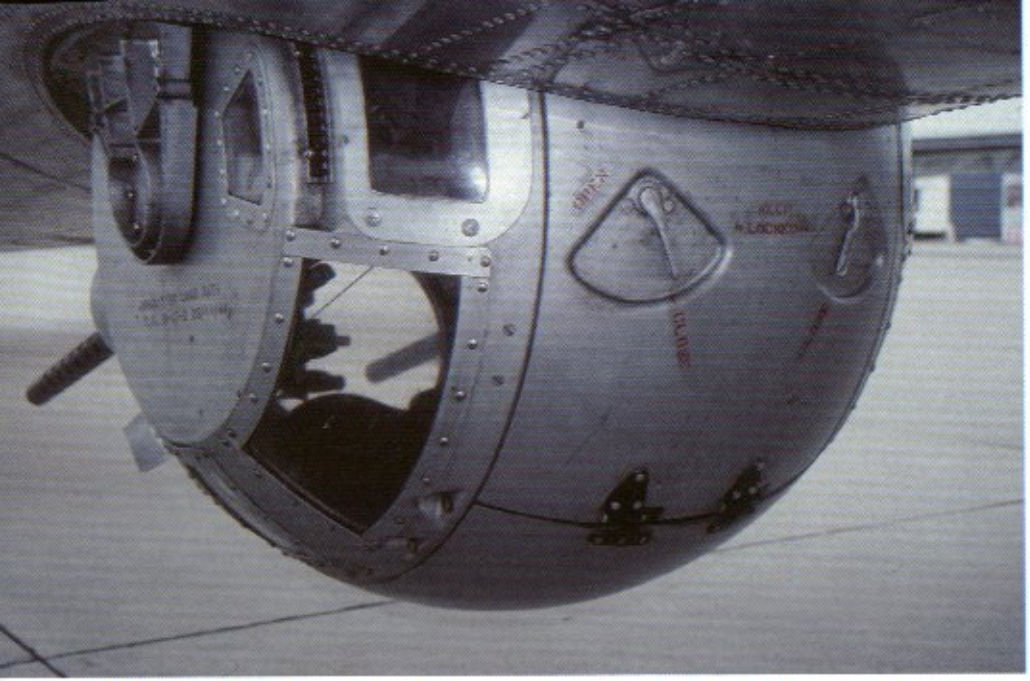
The Ball turret looking aft. The sight reticules were adjusted by the gunner with a foot pedal. (Lou Drendel)

(Above) B-17G-30-BO (42-31828) of the 325th BS, 92nd BW at Alconbury, England in June of 1943. The 92nd was formed in January of 1942, and flew combat missions throughout the war before being disbanded in 1946. (Norm Taylor Collection.)

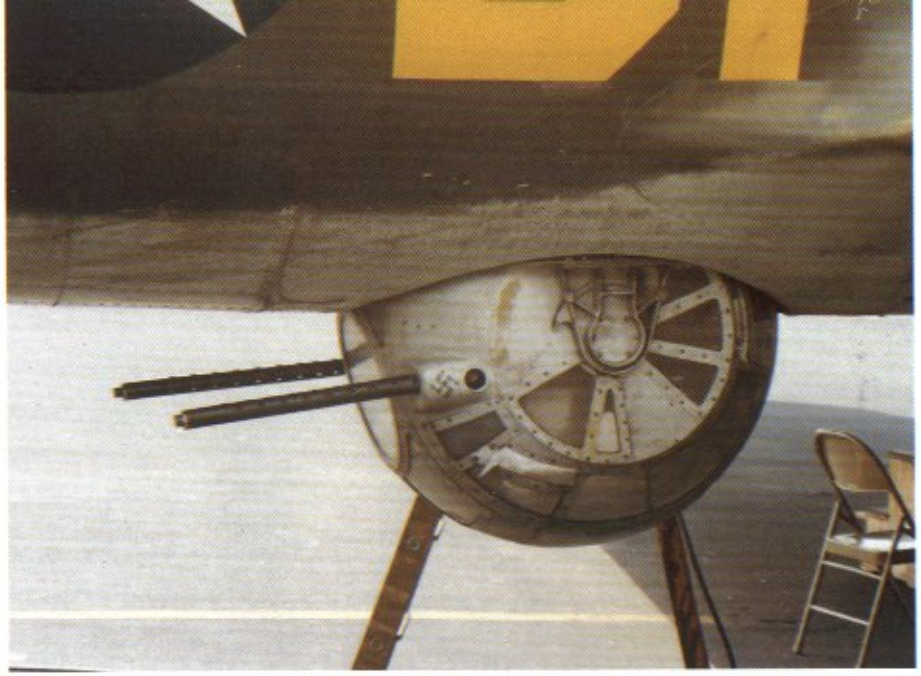
(Below) B-17G-25-DL (serial number 42-107027) of the 322nd BS, 91st BW. HIKIN' FOR HOME logged 125 combat missions and survived two forced landings in France before the war ended. After use as a transport to ferry displaced persons from Africa to Europe, it was scrapped in December of 1945. (Norm Taylor Collection.)

(Above) B-17G-65-BO (43-37613) of the 91st BG was damaged by flak and forced to belly in upon return to Bassingbourne. (Norm Taylor Collection.)

(Below) B-17G-45-DL (44-6195) of the 15th Air Force returned from a combat mission with its right wing in flames. Remarkable airmanship brought it back. The #4 prop is not feathered, but the fabric covered aileron is in tatters. (Norm Taylor Collection.)



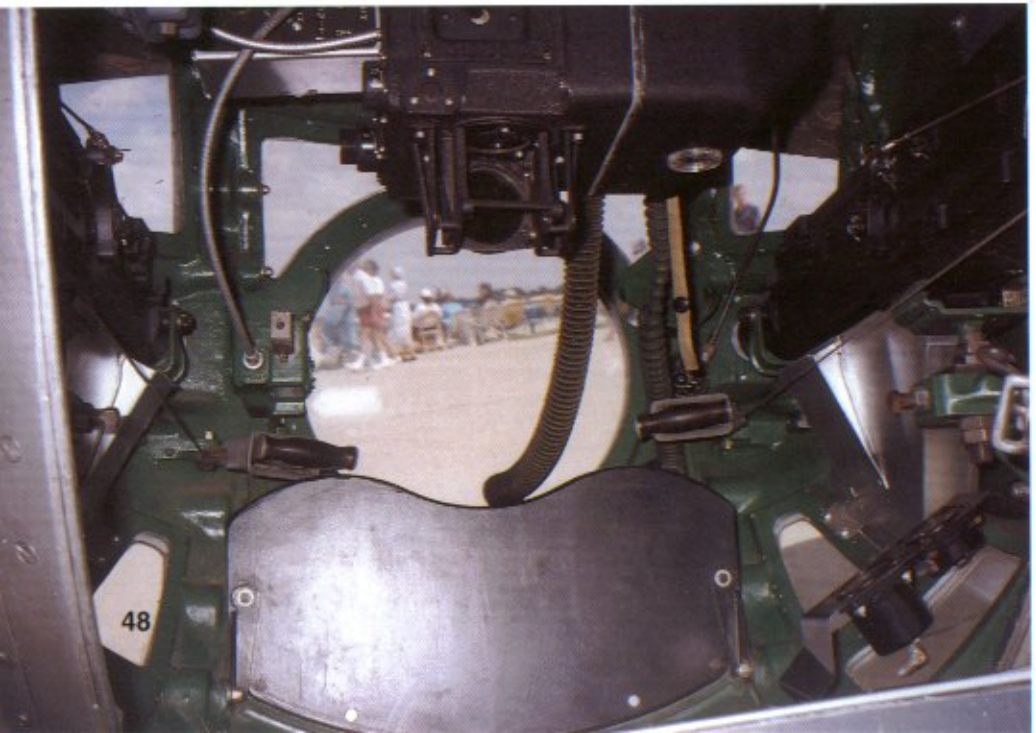
Of necessity the ball turret gunner had to be of small stature, even so, there was not enough room in the turret for the gunner to wear a parachute. (Lou Drendel)

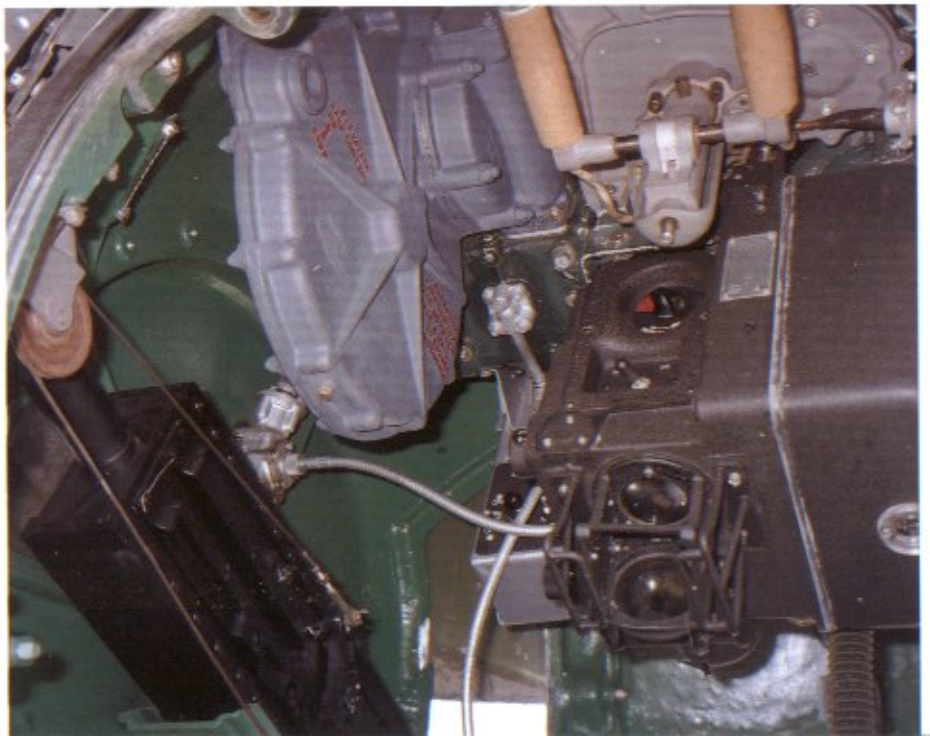


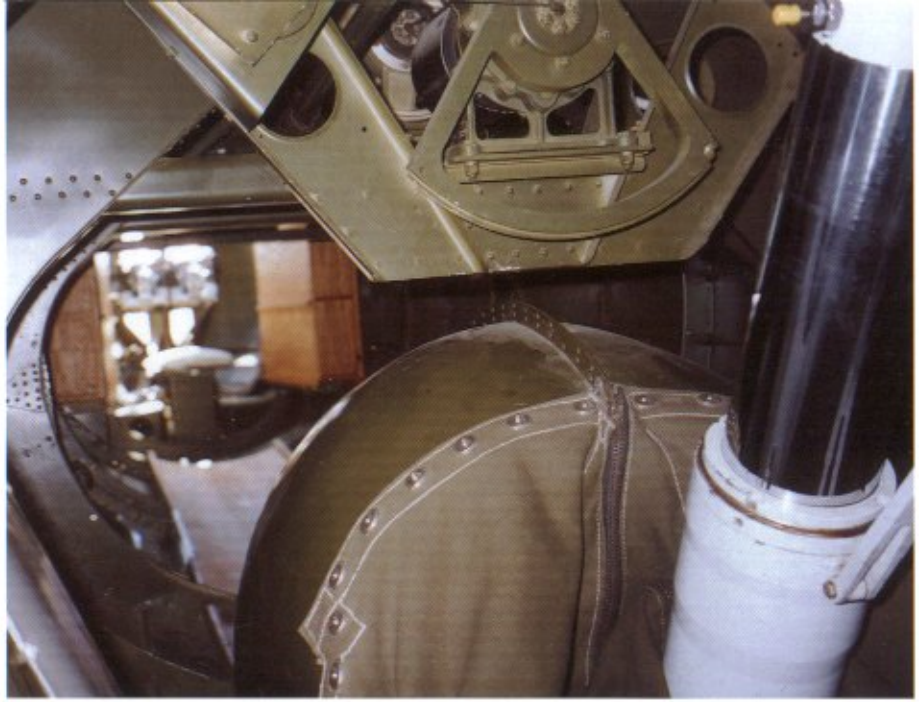
The weathered ball turret of Memphis Belle shows the effects of hard and continuous use. The ball turret could be dropped in flight, either to lighten the airplane or facilitate a belly landing. This required the efforts of two men with a wrench and a hammer.

The ball turret seat can be seen at the bottom. The black handles at the right and left front edge of the seat are gun charging handles. The interphone push to talk button is above the left gun charging handle. Heel rests are behind the handles. (Lou Drendel)

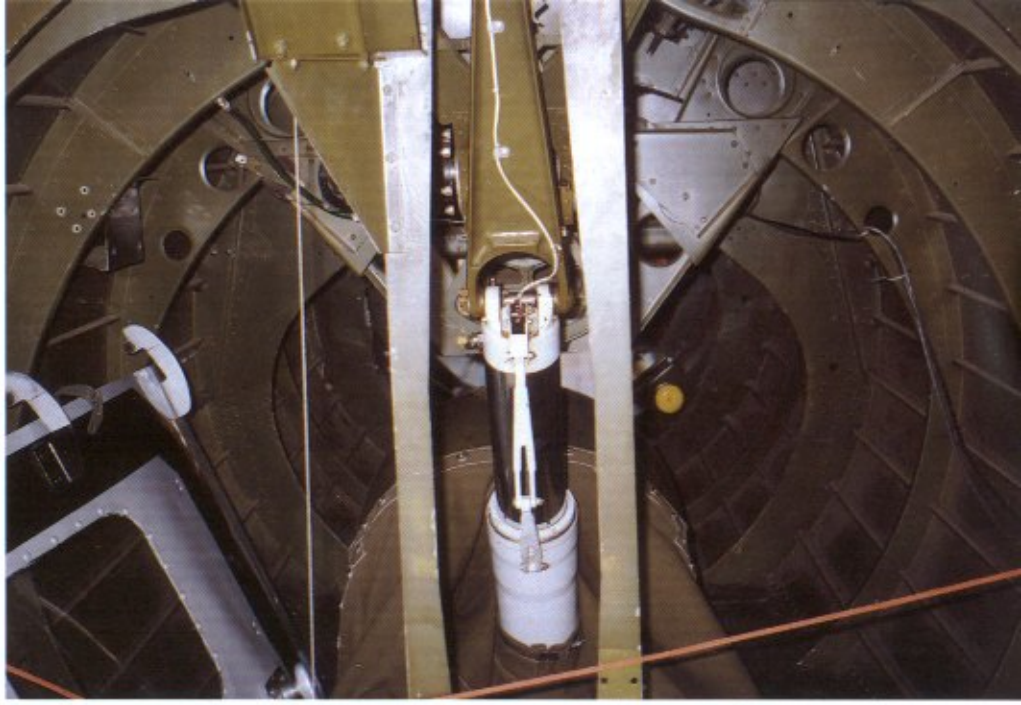
Looking towards the ceiling of the ball turret. The turret control handles are at the top. (Lou Drendel)







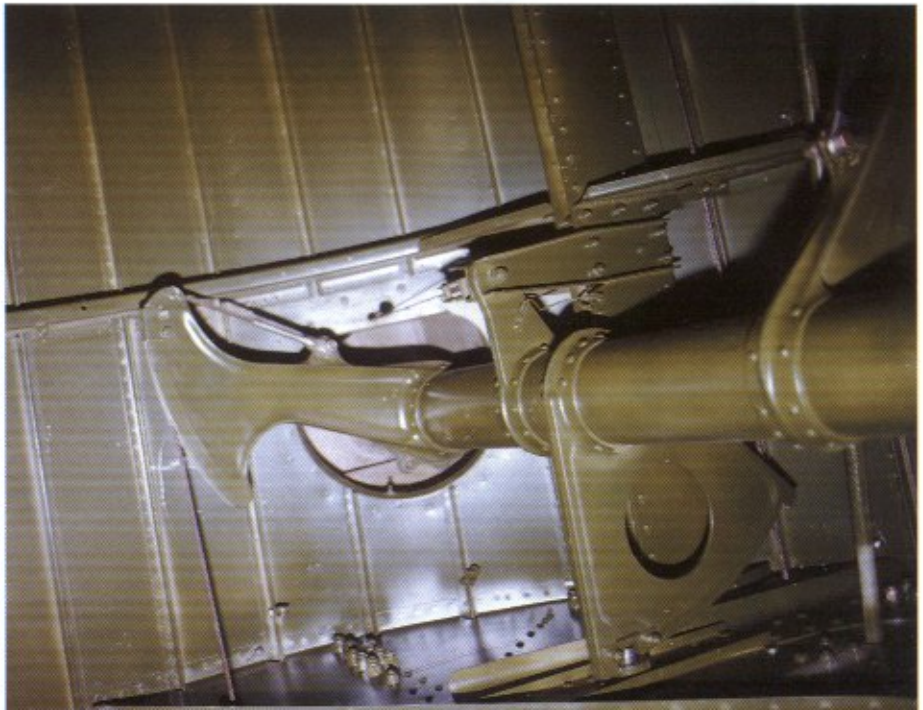
Looking aft from the rear fuselage entry toward the tail gunner's position. The tail wheel oleo is at right, and the tail wheel housing is at right center. (Lou Drendel)

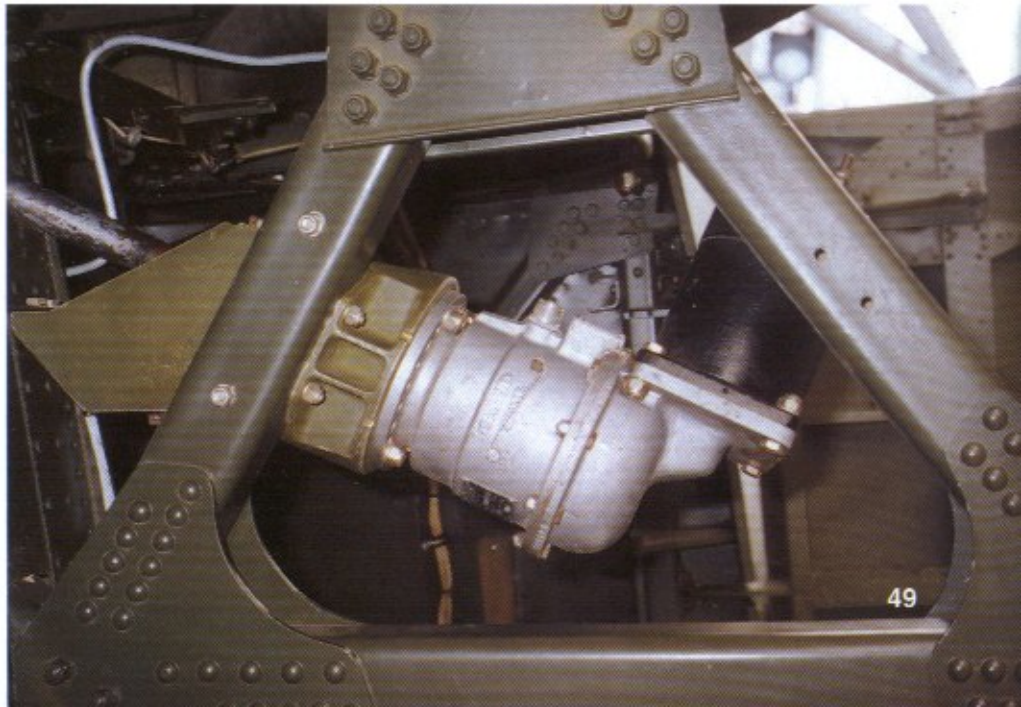


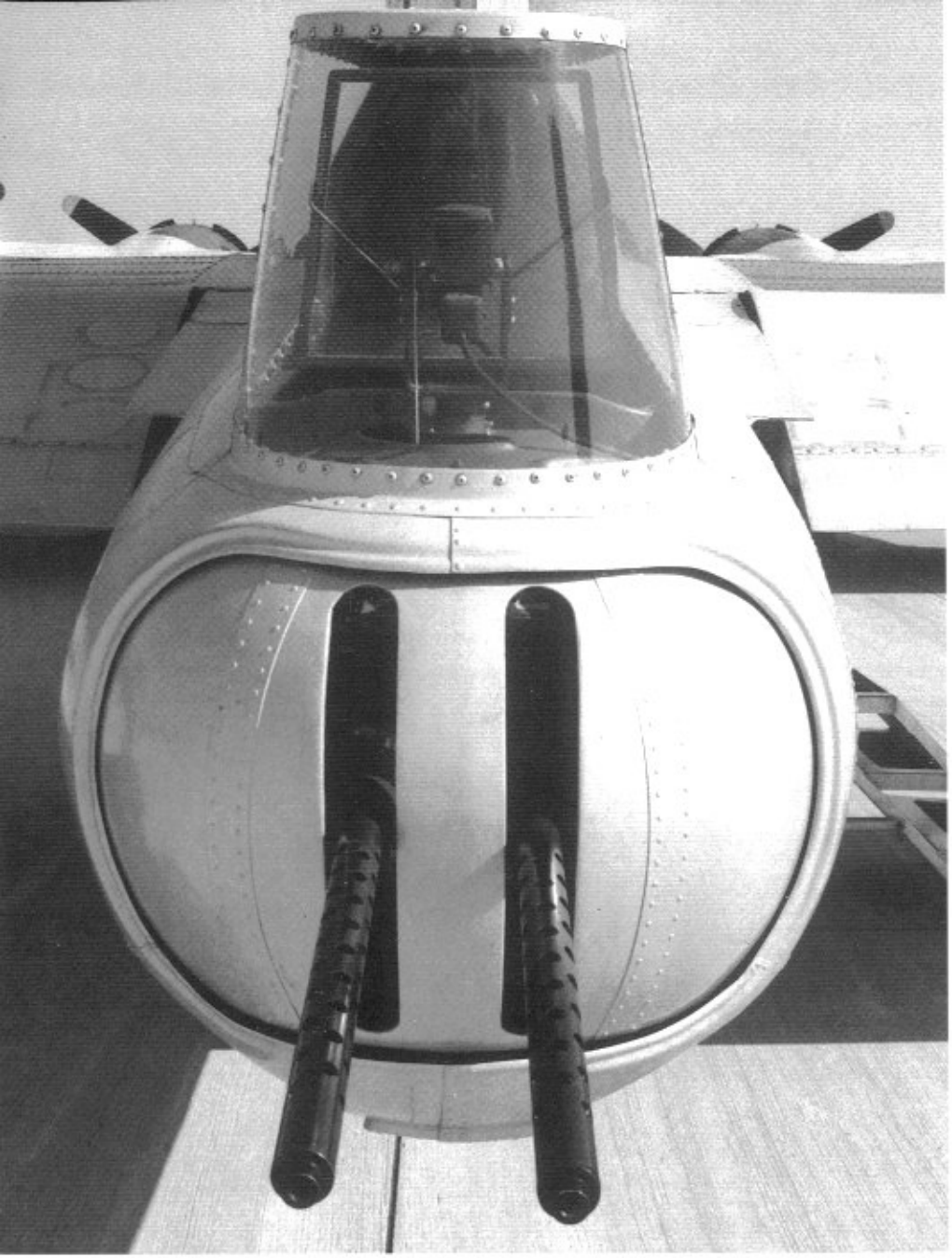
Another view aft from the same position, showing fuselage stringers and longerons. To facilitate tours of the EAA B-17 the crew entry door has been removed and stowed at left. (Lou Drendel)

The elevator control tube and bell crank. (Lou Drendel)

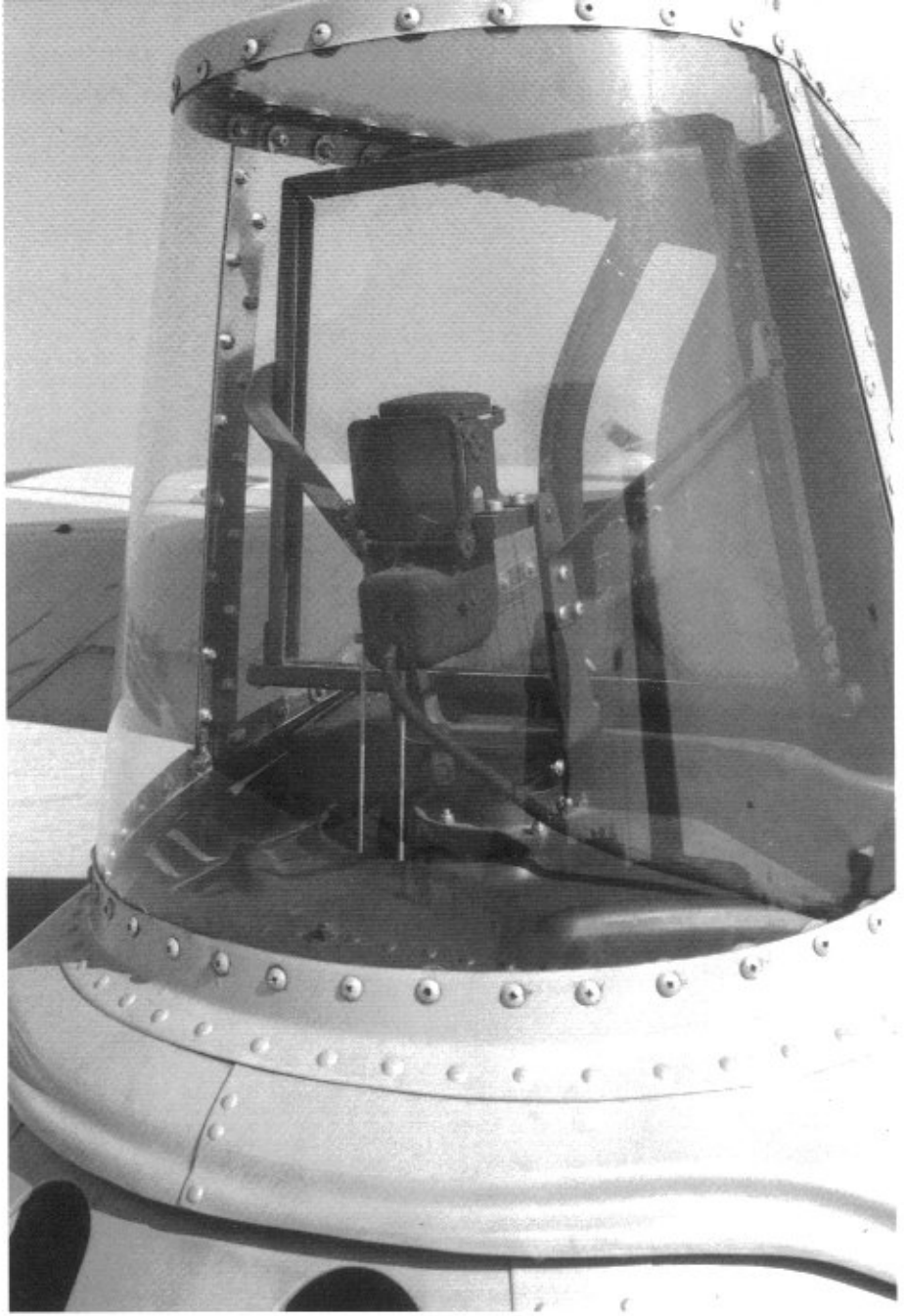
The tail wheel retraction actuator is located above and just aft of the rear fuselage crew entry door. (Lou Drendel)



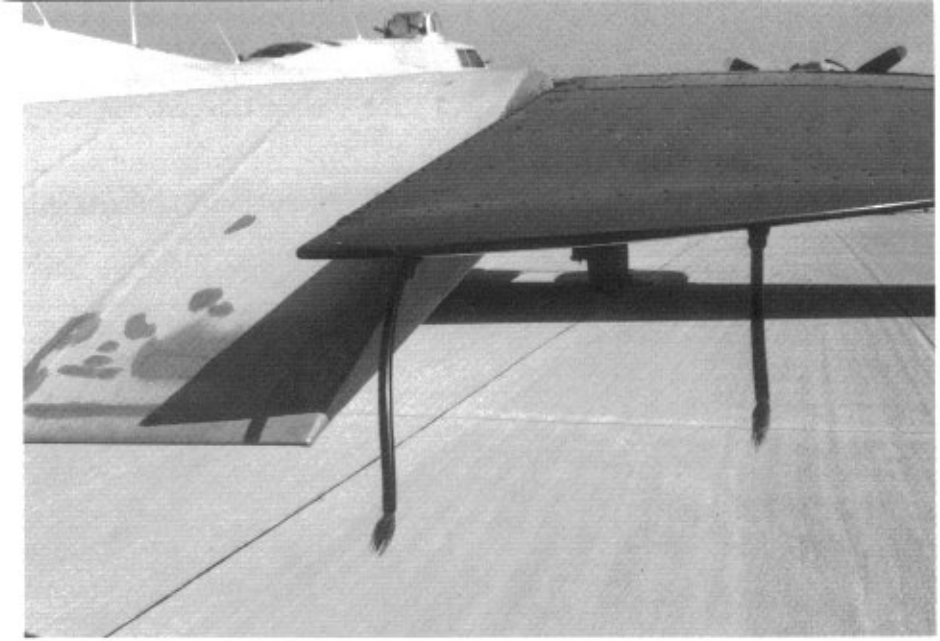




A feature of late G model aircraft was the Cheyenne tail gun installation, which provided a greater field of fire. Early tail gun installations had a severely limited lateral traverse. (Lou Drendel)



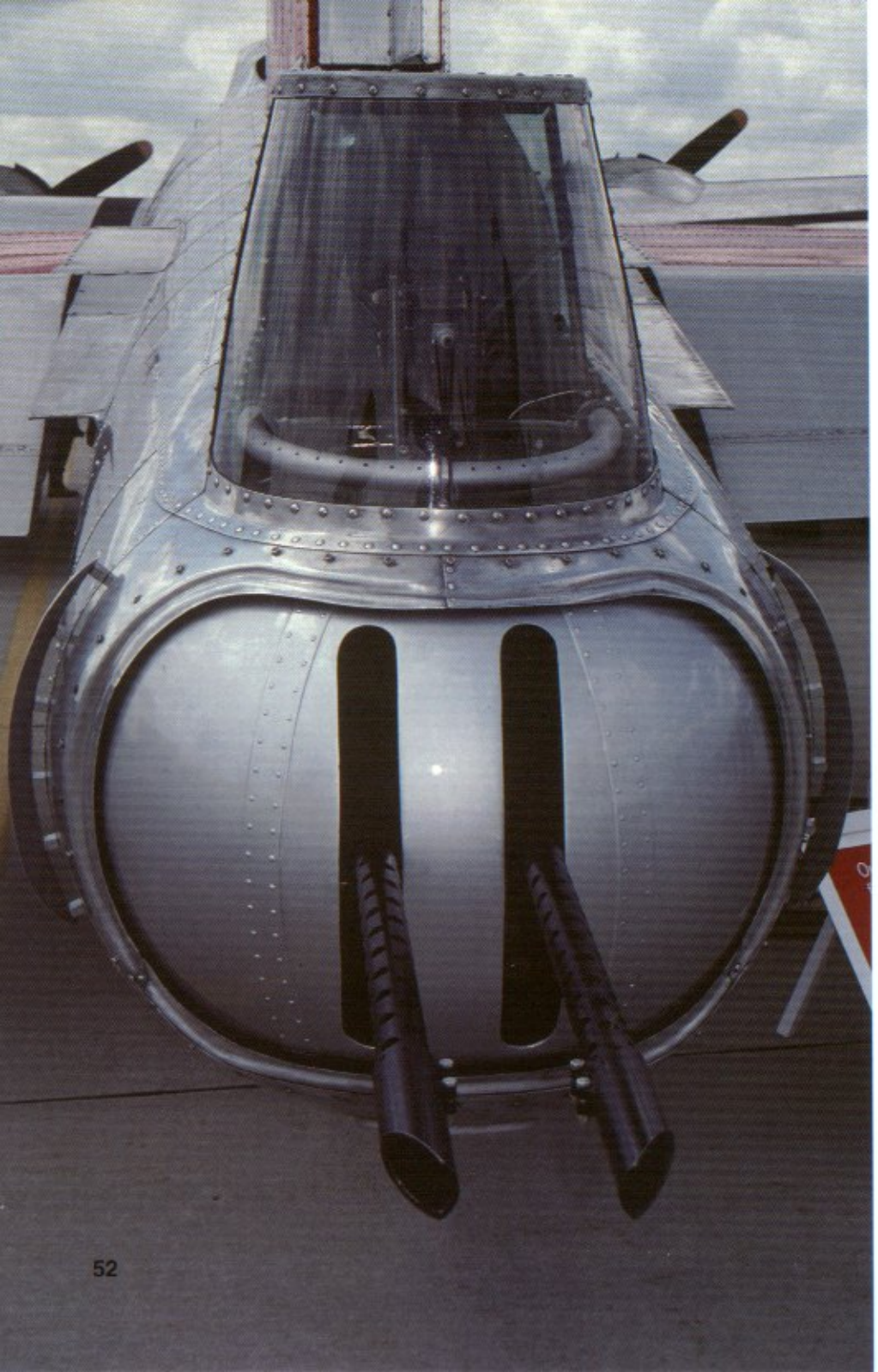
The late model B-17G (90-BO, 50-DL, 55-VE and subsequent aircraft) had a reflector gun sight installed. Previous versions had been equipped with a simple ring and bead sight. (Lou Drendel)

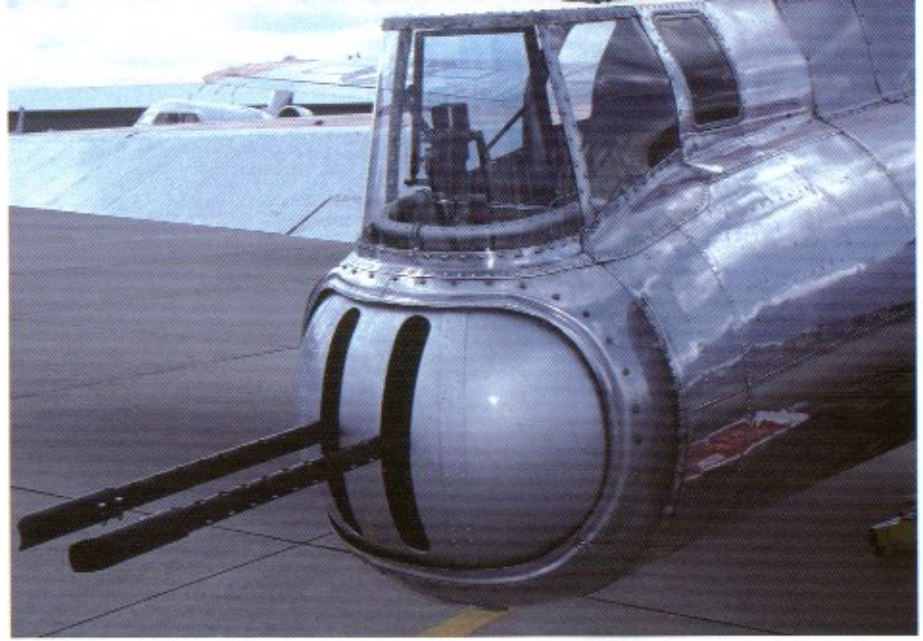


(Above) The control surfaces, ailerons, elevators, and rudder of the Flying Fortress were fabric-covered. The soft rubber 'tails' trailing from the tip are static electricity discharge wicks not found on WWII era B-17s. (Lou Drendel)

(Below) MB-17G-105-BO (43-39119) was assigned to the Eglin Field Test Center, Florida. It was used to drop JB-2 'Loon' missiles over the firing range at Wendover, Utah in 1945. The Loons were captured (or copied) German V-1 Buzz Bombs which had terrorized English cities in 1944. (Armament Museum via Norm Taylor Collection.)

(Above) Later versions of drone controlling Flying Fortresses were designated DB-17, and were stripped of all defensive armament. (Armament Museum via Norm Taylor Collection)

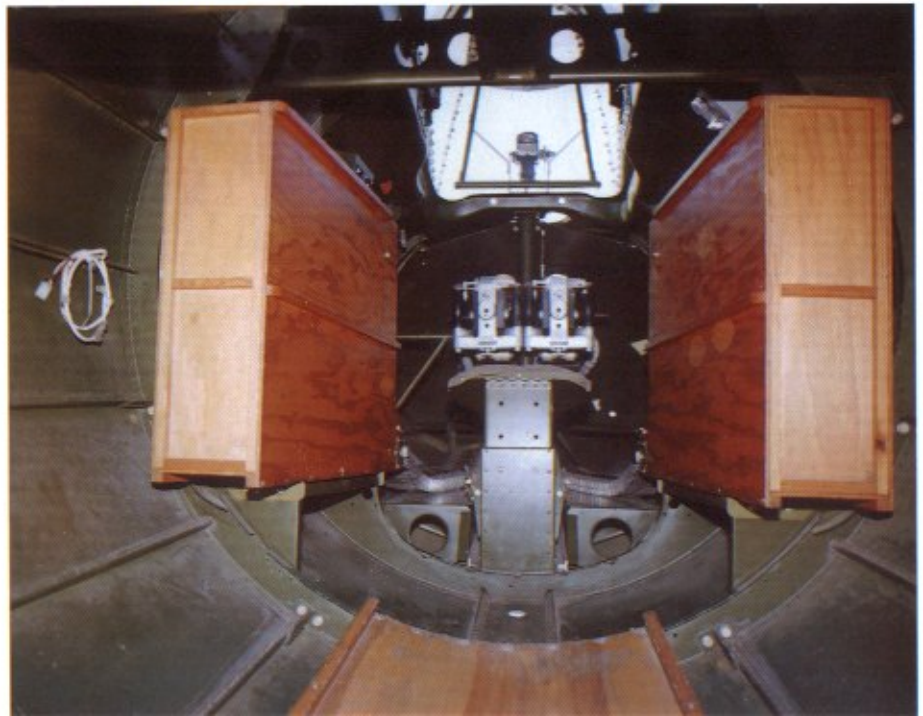


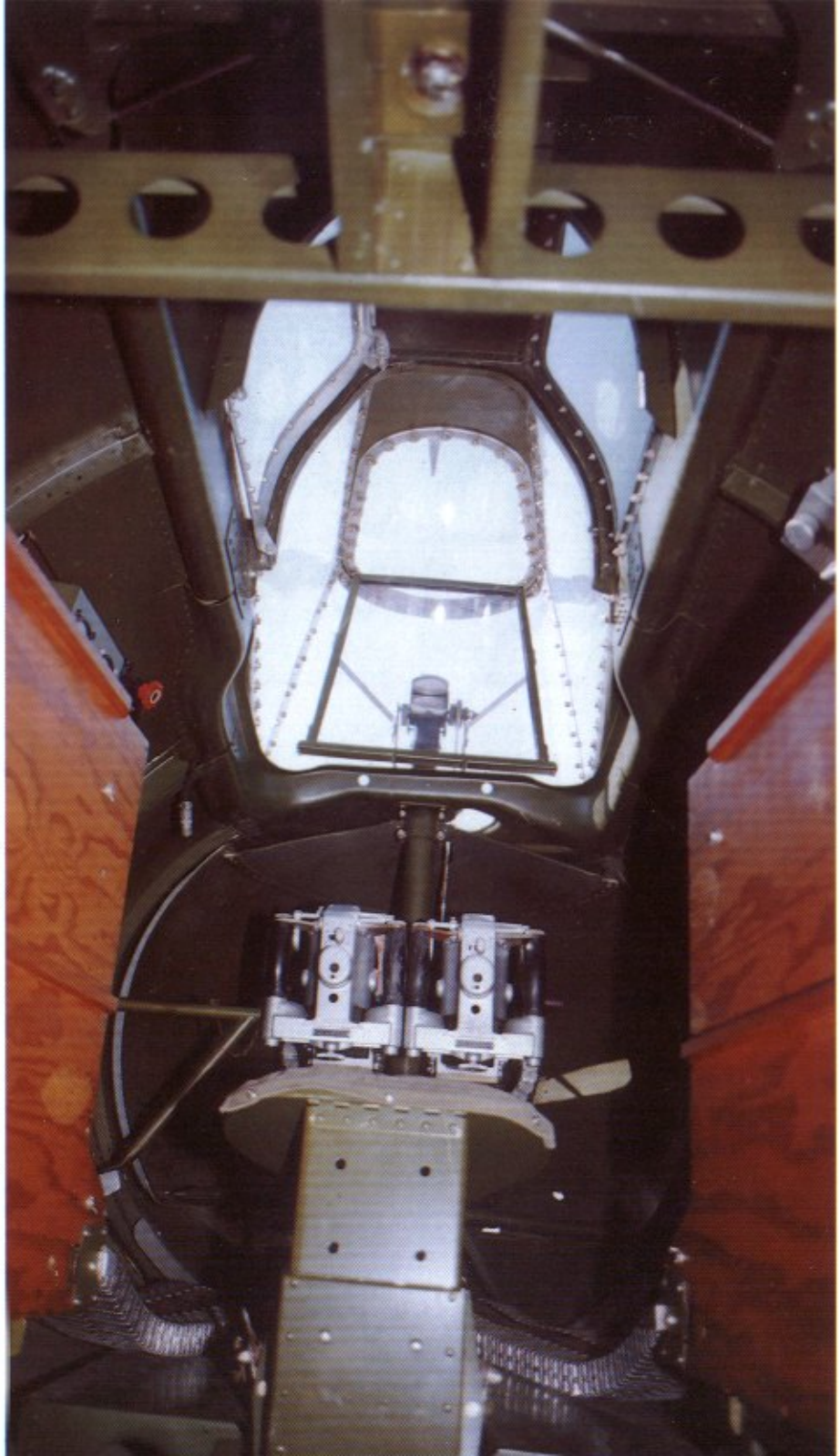


(Above) The Cheyenne tail gun on the B-17 series contributed heavily to the defense of the Flying Fortress late in the war. (Lou Drendel)

(Left) The Cheyenne tail gun installation on the EAA B-17G. An escape hatch was provided for the tail gunner under the port stabilizer. (Lou Drendel)

(Below) Plywood ammunition boxes supplying the tail guns were mounted on the fuselage sides. The tail gunner had armor protection directly in front of him (capable of stopping .30 caliber rounds), but no protection on top, bottom, or sides. (Lou Drendel)

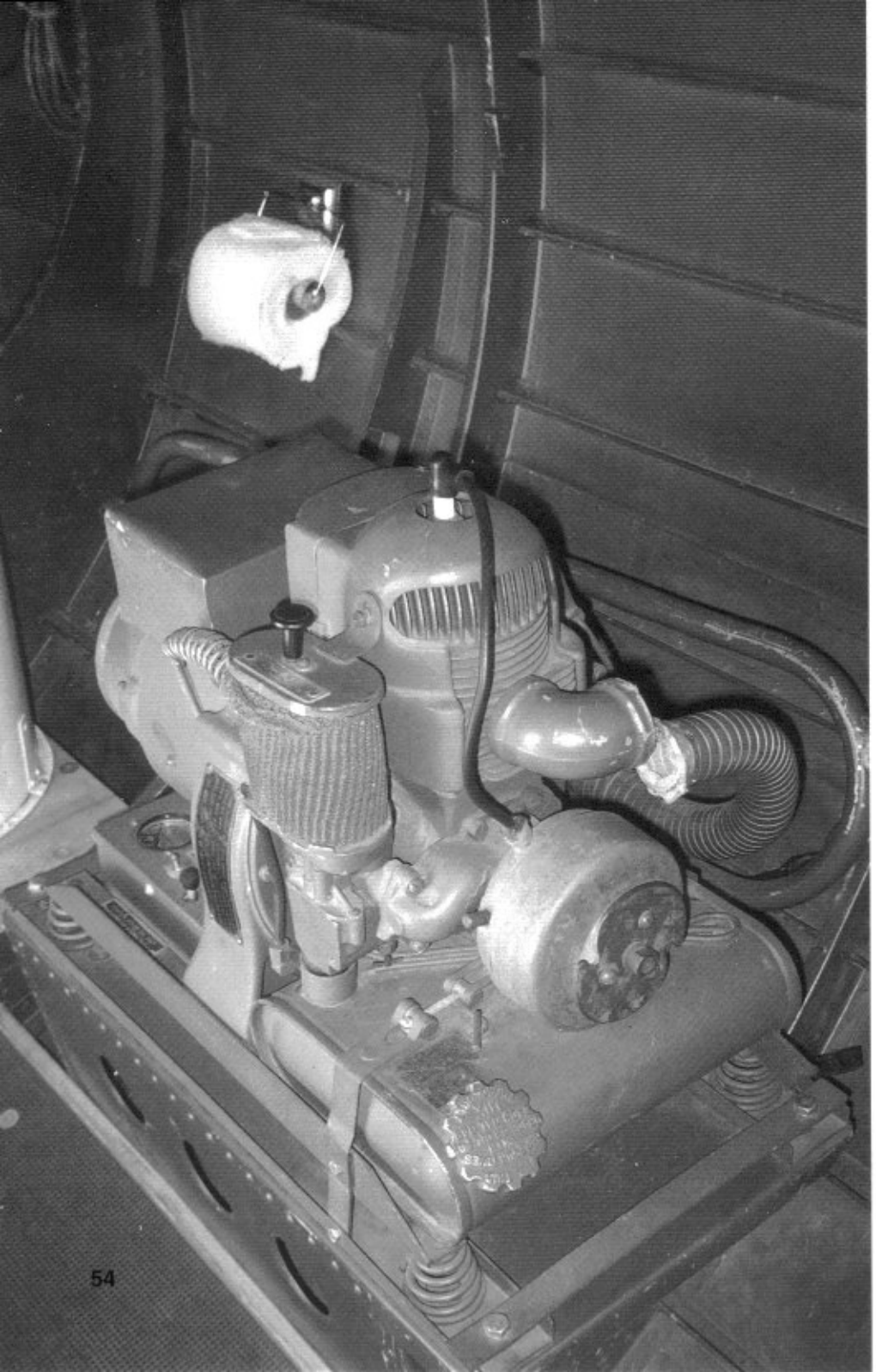




(Above) The early style tail gunner's position had a ring and bead gunsight and limited visibility afforded to the tail gunner.

(Left) The gunner knelt in position, resting his buttocks on the small seat in the foreground. The seat could be adjusted fore and aft and tilted in three positions. (Lou Drendel)

(Below) The rear fuselage entry was used by waist, ball turret, tail gunners, and the radio operator. LIMITED stenciled over the door refers to the civilian airworthiness category.



The paint wear and chipping certainly provides a wartime look to this restoration.

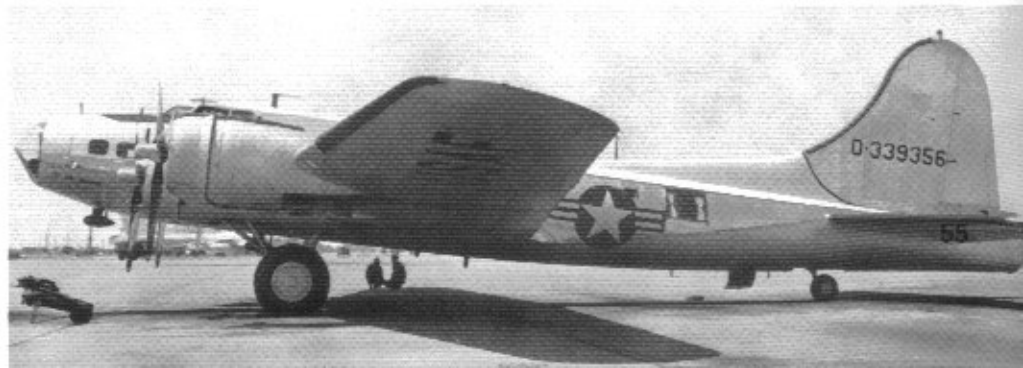
(Left) A C-10 Auxiliary Power Unit (APU) was installed in the rear fuselage of some B-17s. Yes, that is a roll of toilet paper! The toilet is just aft of the APU and is barely visible at left. (Lou Drendel)

This RB-17G-95-VE (44-85534) was flown by Nationalist China on covert missions over the mainland. Painted black, they were equipped with exhaust suppressers, additional oxygen equipment and enhanced surveillance radios. (Clyde Gerdes via Norm Taylor Collection)

(Above and Below) B-17G-110-LO (VE) (44-85813) of AFFTC, at Edwards AFB, California in May of 1957. This was one of two B-17s modified by Boeing to test new engines. They were redesignated Model 299Z and carried civil registrations. The cockpit of the Model 299Z was moved aft 47 inches to maintain a proper Center of Gravity. It is equipped with the P&W 5,500 hp XT-34 turboprop engine. Below, it is seen fitted with the R-3350 piston engine. (Norm Taylor Collection)

(Above) WB-17G-110-VE (44-85795) at Logan Airport, Boston on 16 May 1948. The nose art WEATHER RADAR RESEARCH defines the mission. (Norm Taylor Collection)

(Below) VB-17G-85-BO (43-39356) assigned to the 8th Air Division at Barksdale AFB, Louisiana was at Boeing Field on 30 June 1956 to help celebrate several generations of Boeing Bombers. (Pete Bowers via Norm Taylor Collection)



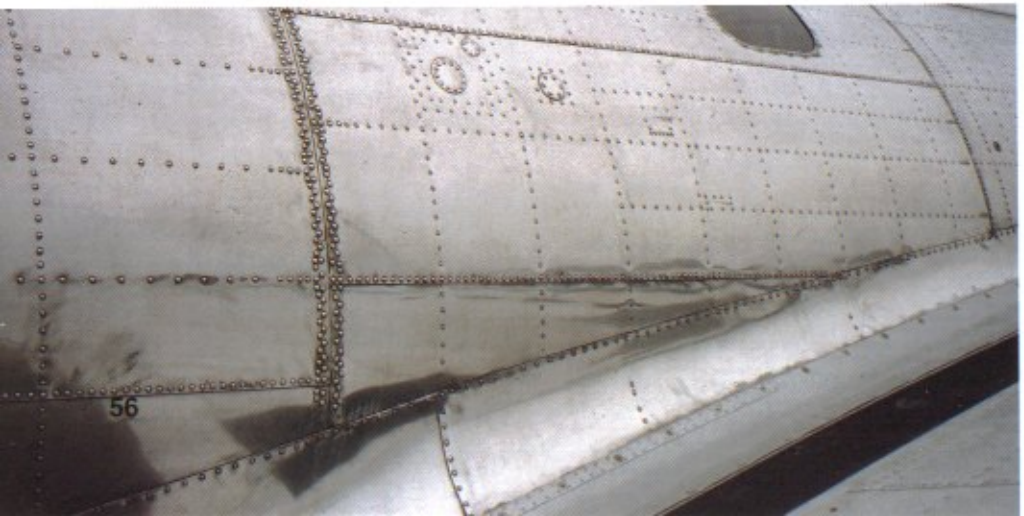
The fuselage wing fairing of this B-17F has been removed to expose the cables and wiring.

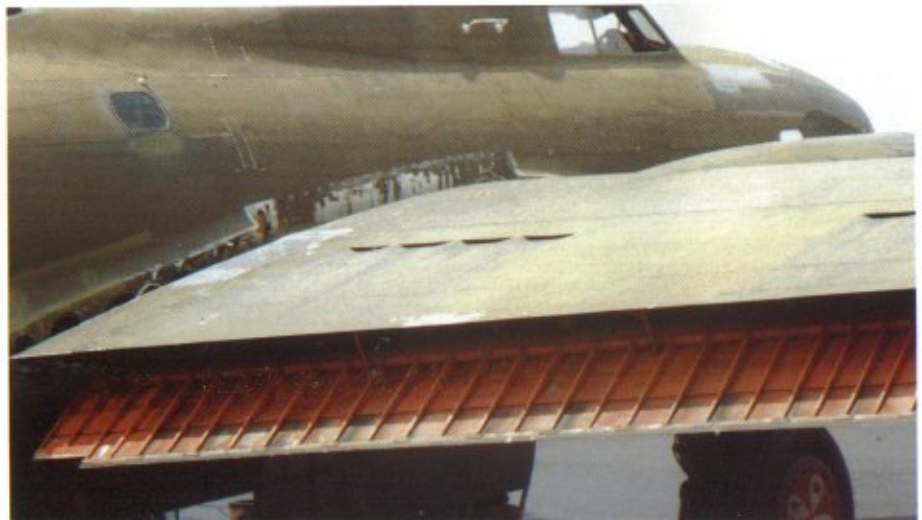
The intercooler intakes are in the lower leading edge of the B-17G wing. The small tube in the left intake provides positive pressure to one of the fuel cells. The scoop to the left of the tube is a vent. (Lou Drendel)

The wing to fuselage fairing of the B-17G. The black strip on top of the wing is a reinforced walkway. The window is in the radio compartment. (Lou Drendel)

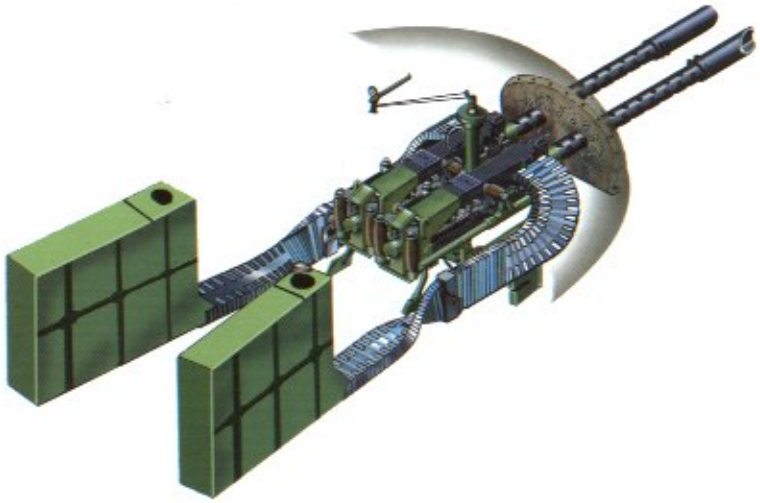
Rear view of No.1 engine. The extremely thick chord of the B-17 wing is obvious. Slots in the top of the wing facilitate engine cooling. (Lou Drendel)

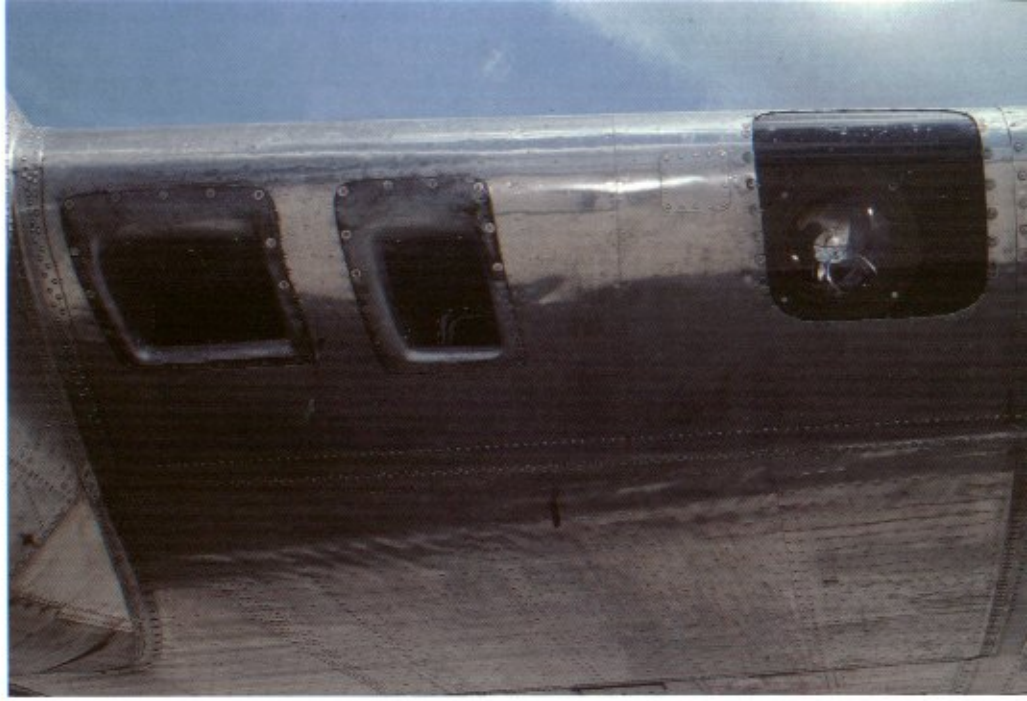
The large flaps were electrically operated. They could be extended manually in case of an electrical failure. Full flaps could reduce stalling speed by as much as 15 mph.





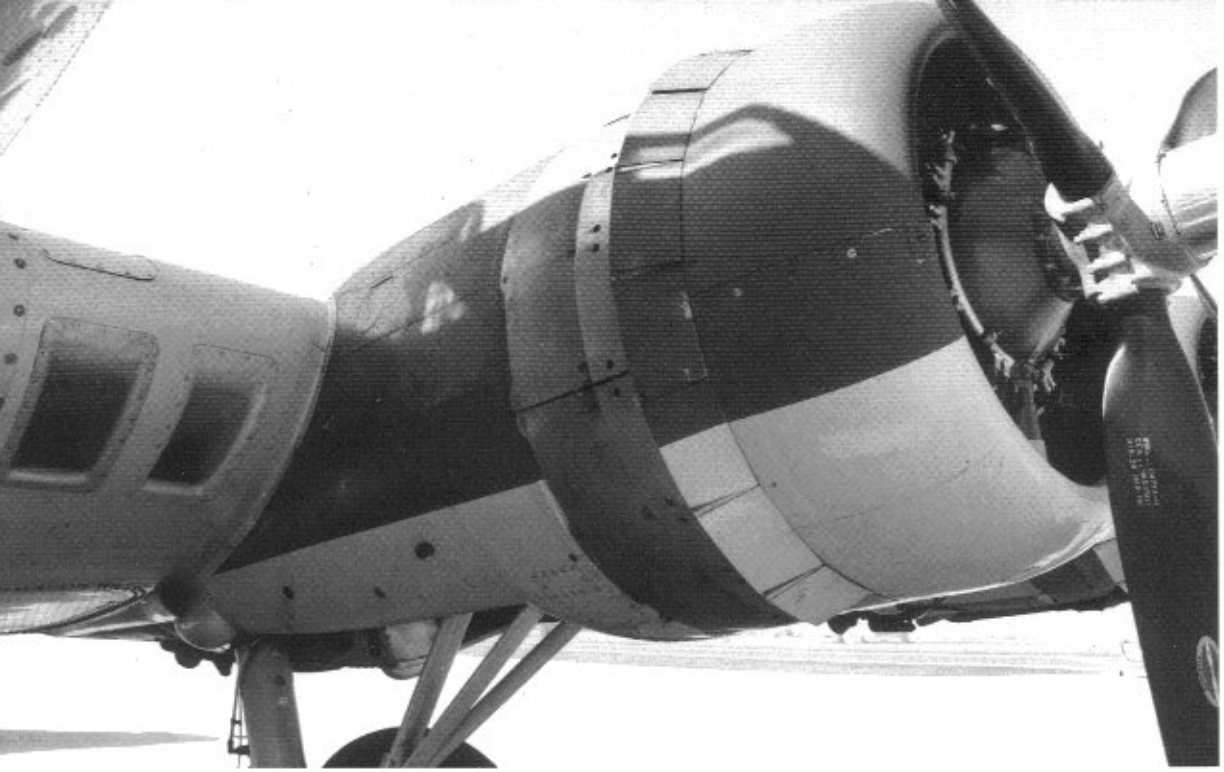
Tail Twin .50 Caliber Machine Guns

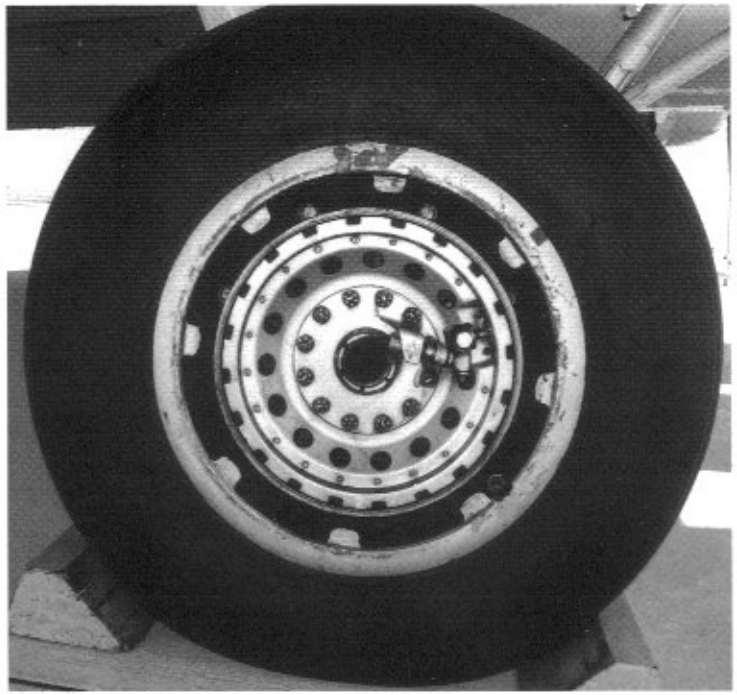




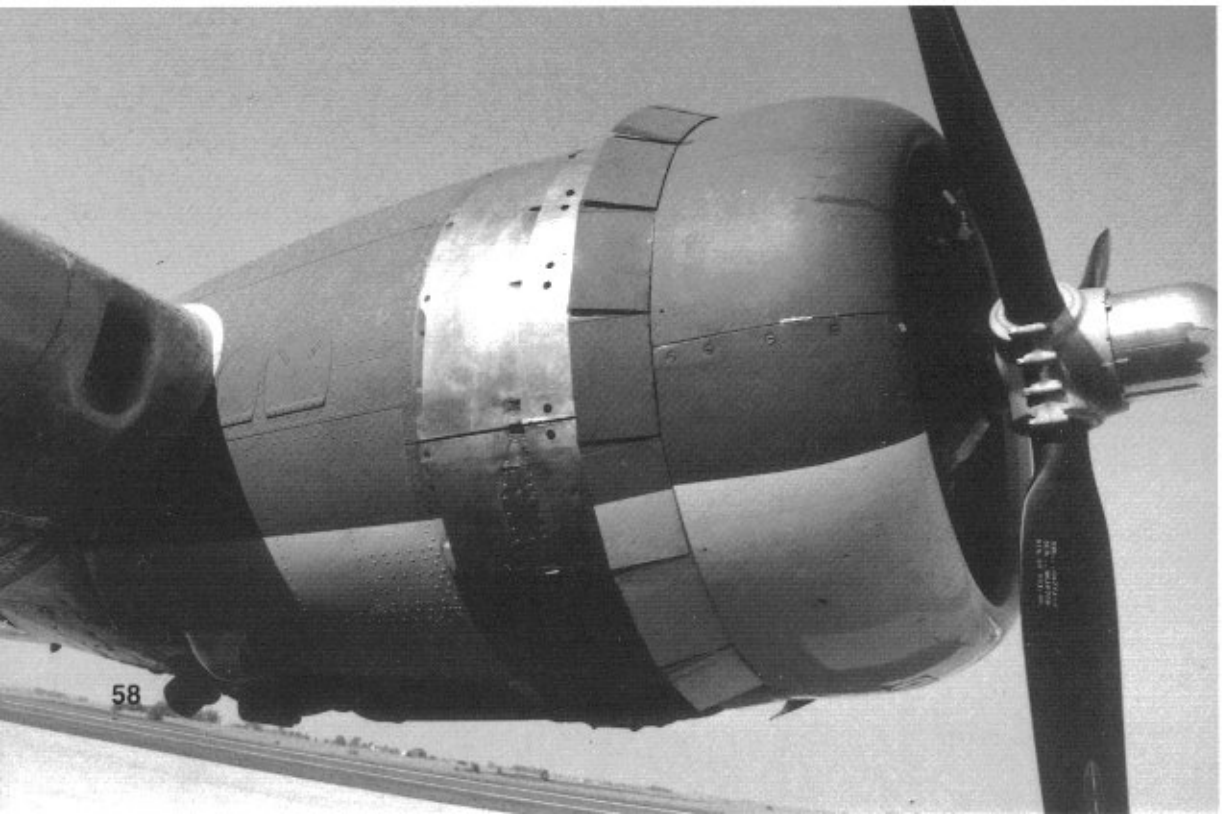
Leading edge intakes provided air for superchargers and overboard fuel dump pressurization. The landing light is outboard of the intakes. (Lou Drendel)

The access panels are open on the underside of the wing while the Lone Star B-17G undergoes a phase inspection. (Lou Drendel)



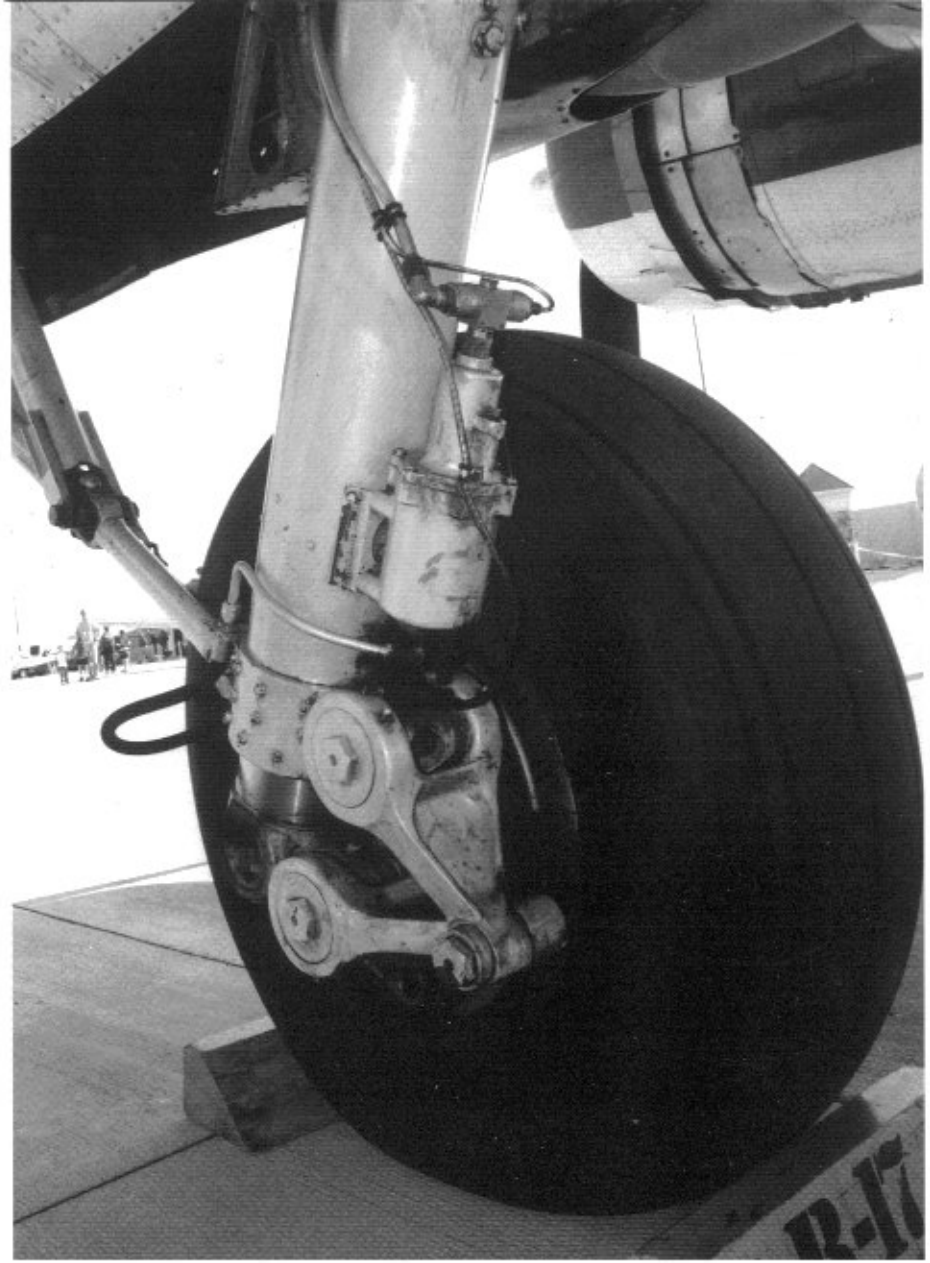


(Above) Outboard view of the main gear, showing hydraulic lines and brake assembly. (Lou Drendel)



(Above Left) Inboard side of the No.2 engine on the EAA B-17. The cowl flaps are hydraulically operated and are in the open position to facilitate cooling while on the ground. (Lou Drendel)

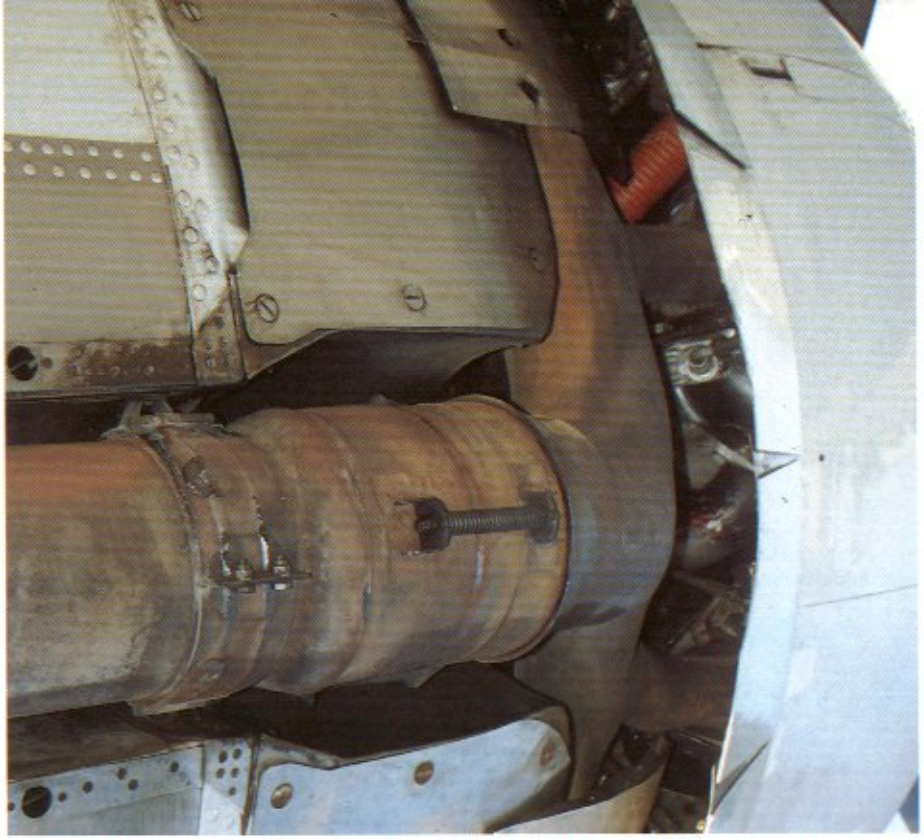
(Left) Inboard view of the No.1 engine on the EAA B-17. Propellers are Hamilton Standard hydromatically controlled for constant speed and full feathering. (Lou Drendel)



(Above) Inboard view of the starboard main landing gear, looking forward. The torsion links at bottom allow for extension and compression of the oleo. The brake cylinder valve assembly is attached to the rear of the main gear leg. (Lou Drendel)

(Right) Inboard view of the port main gear and its 56 inch AN-C55 Type 1 GFE tire. (Lou Drendel)

The B-17G was powered by four nine cylinder Wright R-1820-97 engines, capable of 1,200 HP at take off. Maximum speed was 315 mph, with a cruising speed of 160 mph. (Lou Drendel)



Through the open cowl flaps the exhaust collector ring leading to the exhaust shroud can be seen. (Lou Drendel)

Superchargers were installed on the bottom of each engine in the B-17 series. These superchargers dramatically increased performance, giving the B-17G a service celling of 35,600 feet and a maximum recommended speed at 25,000 feet of 265mph. (Lou Drendel)

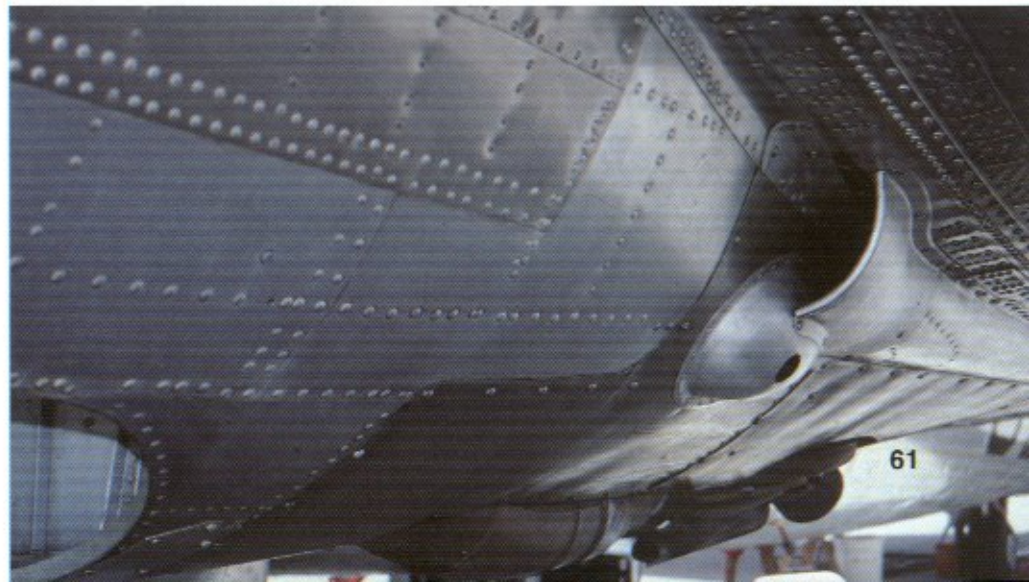
The exhaust of the B-22 Supercharger. The exhaust heat burned the metal to many different colors. (Lou Drendel)

The scoop and air vent fairings on the inboard side of the No.1 engine nacelle. (Lou Drendel)

No.3 and No.4 engine nacelles from the cockpit of YANKEE LADY. (Lou Drendel)

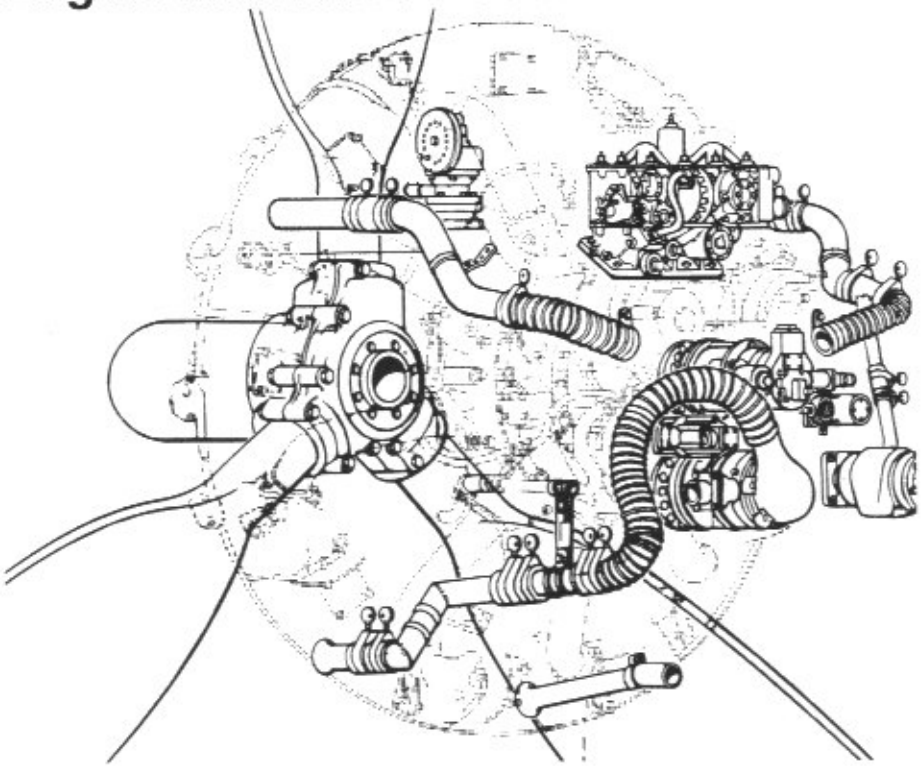
The exhaust shroud on the outboard nacelle of No.2 engine. This shroud collected and distributed heat to the heating system. The main gear wheel well is at the bottom. (Lou Drendel)

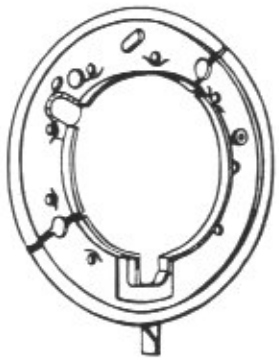
The large scoop at the rear of the No.2 nacelle leads to the Supercharger intercooler air filter. (Lou Drendel

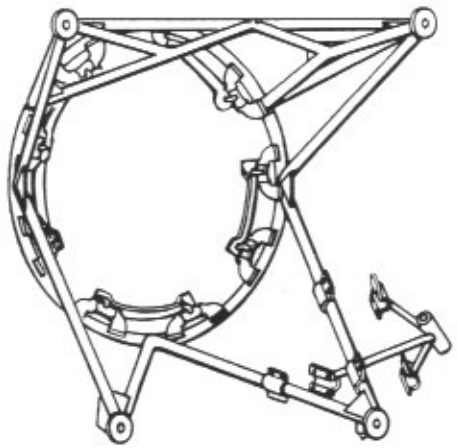


A 91st BG Flying Fortress undergoing an engine change at Bassingbourne during the Winter of 1944. (Norm Taylor Collection)

Engine Mount and Accessories







B-17G F-BEEA, Chateau de Verneuil, served with the IGN (French National Airline) from 1947 until being destroyed in a takeoff crash at Binbrook, England during the filming of Memphis Belle in 1989. (Norm Taylor Collection)

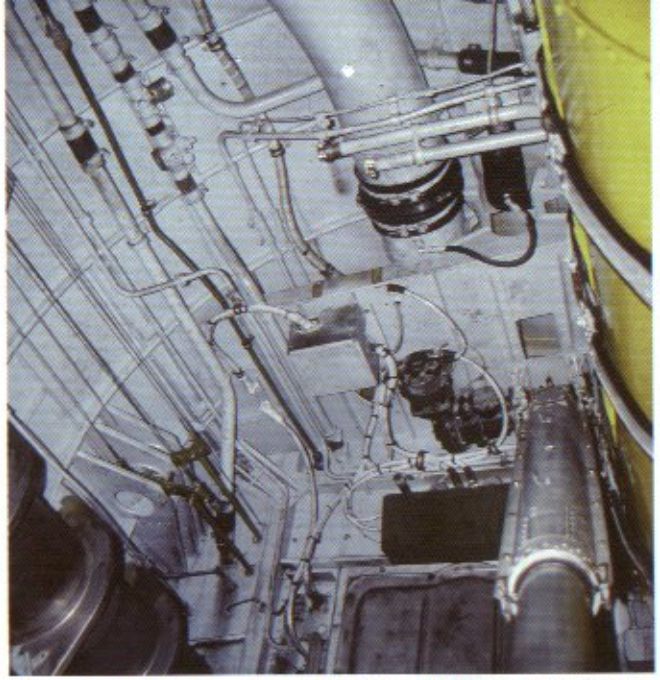
This QB-17G-100-VE (44-85662) at Keesler AFB, Mississippi in 1953 is painted overall orange with black stripes. QB-17s were normally controlled by a DB-17. They were used as targets and to sample the atmosphere after Atomic testing at Bikini Atoll. The last active B-17 in the USAF inventory was a drone which was shot down by a missile in 1960. (Norm Taylor Collection)

A U.S. Coast Guard PB-1G Flying Fortress was used to count icebergs in the Baffin Bay during a 1949 census, which counted 40,232 icebergs. The USCG used PB-1Gs from 1946 to 1958. They were equipped with aerial cameras in side blister windows. (USCG via Norm Taylor Collection)

A VB-17G of the 401st Bomb Group at Hamilton AFB, California on 12 August 1947. (USAF via Norm Taylor Collection.)

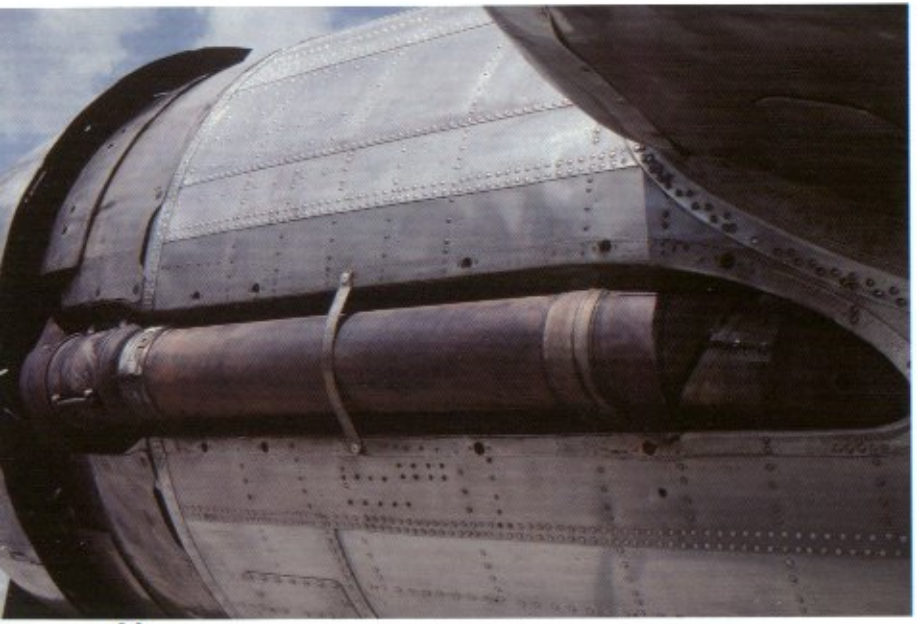
Heat from the supercharger not only discolors the metal of the supercharger, but the hot exhaust discolors the metal of the surrounding nacelle. (Lou Drendel)

An open engine access panel exposes the exhaust collector ring (brown), the engine mount tubes (gray), and the engine accessories (red). (Lou Drendel)



The main landing gear wheel well. The yellow tank at right is the engine oil tank. The rubber fuel bladder is on the rear wall of the well. (Lou Drendel)

The exhaust shroud runs from the collector ring behind the engine to the supercharger. (Lou Drendel)



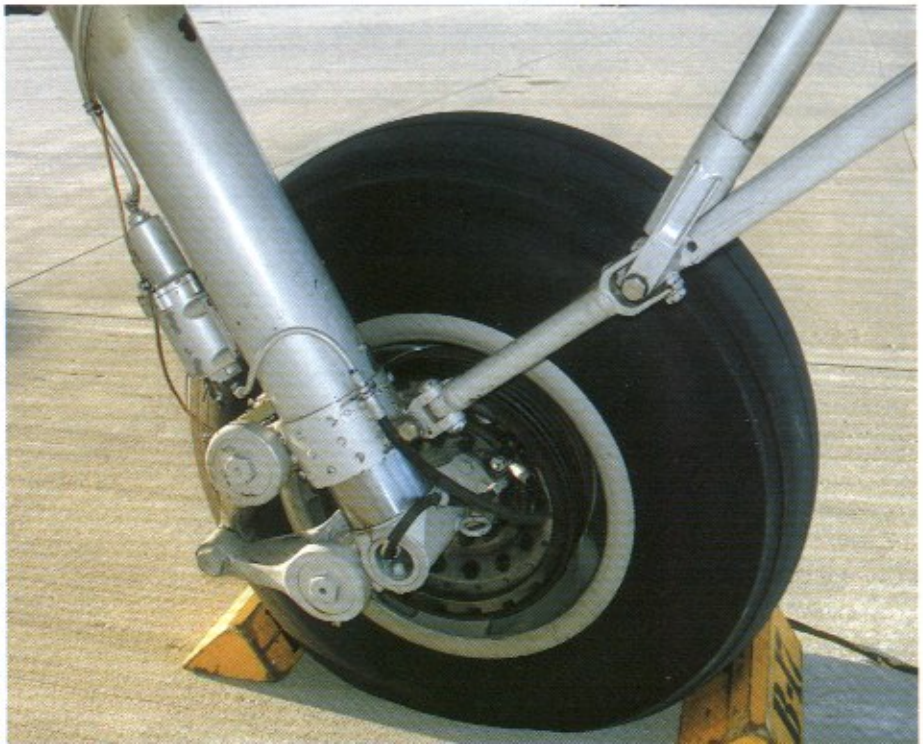
The cowl flaps on the B-17F Memphis Belle, exhibiting a great deal of paint chipping, are in the closed position.

The main landing gear looking aft. The inboard V shaped linkage on the left is the retraction mechanism. (Lou Drendel)

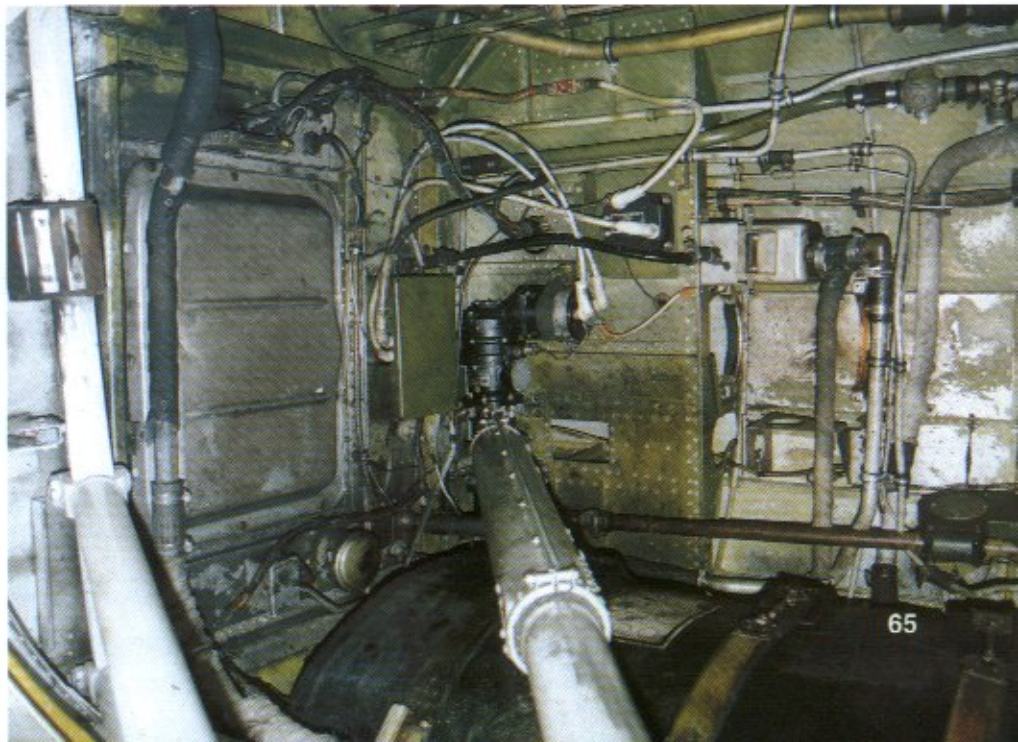
Main gear, looking forward. The brake lines can readily be seen. (Lou Drendel)

The tires on the Flying Fortress are massive. (Lou Drendel)

The main landing gear design remained unchanged throughout the life of the B-17. It could be lowered by hand using hand cranks. (Lou Drendel)

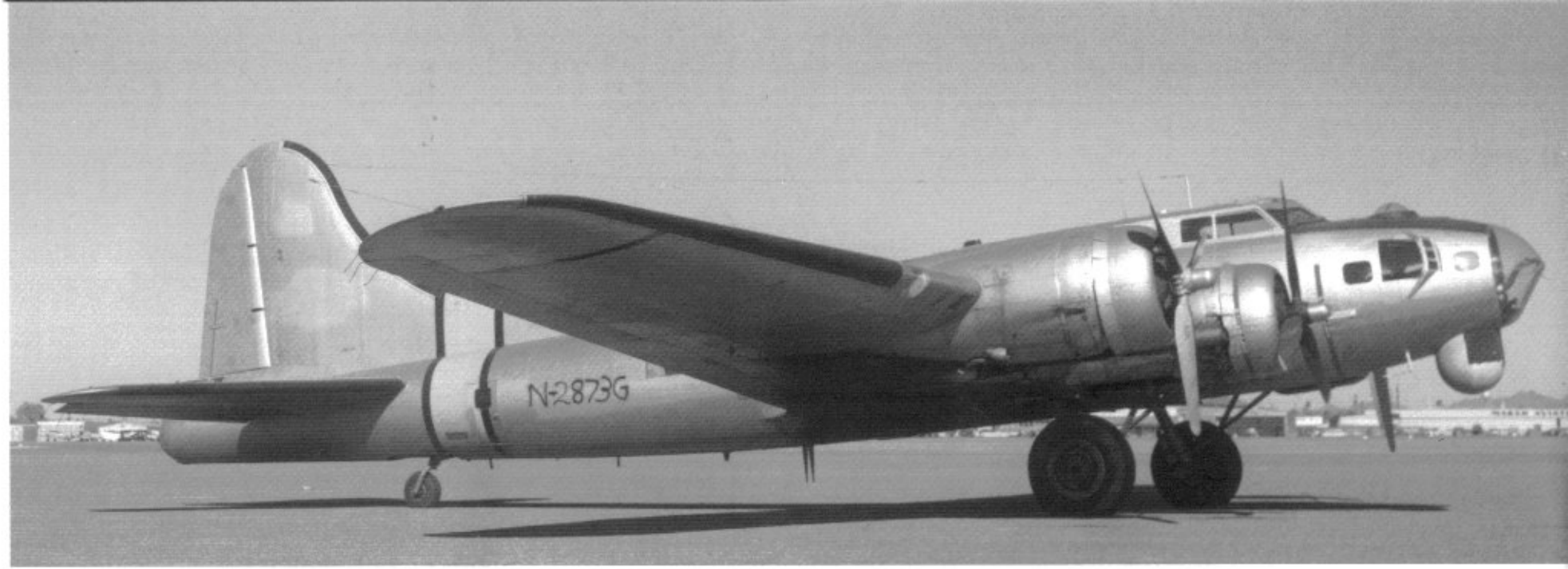


The main gear well of the EAA B-17. The engine oil tank is black. Each engine had a similar tank in the same place, however, the color varied. (Lou Drendel)



(Above) BOOPS, a VB-17G-75-DL (44-83259), was the personal aircraft of USAAF Chief of Staff General Carl 'Toohey' Spaatz. (Norm Taylor Collection.)

(Below) B-17G-85-DL (44-83542) carried the civil registration of N9324Z when it was owned by Aero Union Corp, of Anderson, California. Seen at Anchorage, Alaska on 14 August 1969 as a forest fighter, it was one of 23 B-17s converted to the fire-fighting configuration. They were capable of carrying 1,800 gallons of borate fire retardant. (Norm Taylor)



(Above) This ex-PB-1G carries the fresh civil registration of N28373G. Probably taken in the late 1950s. (Harry Gann via Norm Taylor Collection.)

(Below) B-17G-110-VE (44-85813) was one of two Forts modified to test engines. Seen at Gray Bull Airport, Wyoming on 3 June 1967 with the civil registration of N6694C. (Norm Taylor Collection.)

The Yankee Air Force B-17G-110-VE (44-85829) was among the last B-17s manufactured. YANKEE LADY carries the markings of the 381st Bomb Group, which was based at the 8th Air Force base at Ridgewell, Essex. (Lou Drendel)

Shoo Shoo Shoo BABY was named for the popular wartime song. Crew Chief Hank Cordes picked the name and Tony Starcer, one of the most famous nose artists, painted the name and namesake. It is seen here upon completion of its restoration some 50 years after it flew its last combat mission. (David F.Brown)

The elevator trim tab on the Flying Fortress was large by any standards. (Lou Drendel)

The retractable tail wheel used a 26 inch smooth tire. The tail wheel was locked for take-off and landing and unlocked to caster during taxiing. (Lou Drendel)

(Above) 'Living History' actors traveled with "FUDDY DUDDY", the B-17G (44-83563) of the National Warplane Museum, Geneseo, NY to an airshow at Clark County Airport, Indiana in September of 1994. The pilot wears the Type B-6 winter flying jacket, QAC parachute harness, and a B-4 Mae West life jacket. (Lou Drendel)

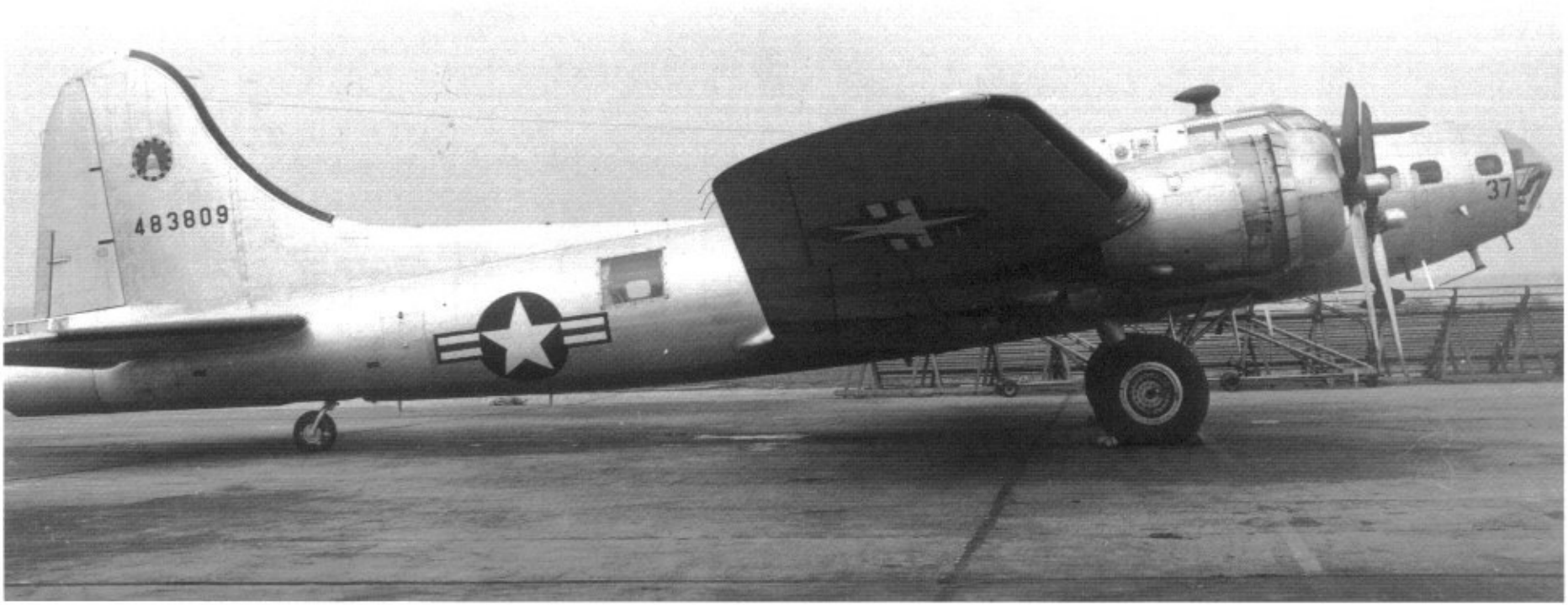
(Above) Reverse view of QAC parachute harness. The pilot and navigator are both wearing A-6A flying shoes. The pilot also wears a 50 mission "crushed" hat. (Lou Drendel)

(Below) Common flightline transportation was the ubiquitous Jeep, often overloaded with an entire B-17 crew and their equipment. (Lou Drendel)

(Above) Gunners adjusting equipment. The gunner in the foreground wears a B-1 summer cap, while the gunner at rear wears the B-2 cap. The Irving Kit Bags in the foreground are original issue. (Lou Drendel)

(Above) B-17G-105-VE (44-85784) at RNAS Yeovilton, England in August of 1981. When this partially restored Fort was photographed it was marked as belonging to the 457th BG. It is currently operated by the B-17 Preservation Trust Ltd, at Duxford as "Sally B" of the 351st BG whose WWII base was Polebrook. (P. Bennett via Norm Taylor Collection.)

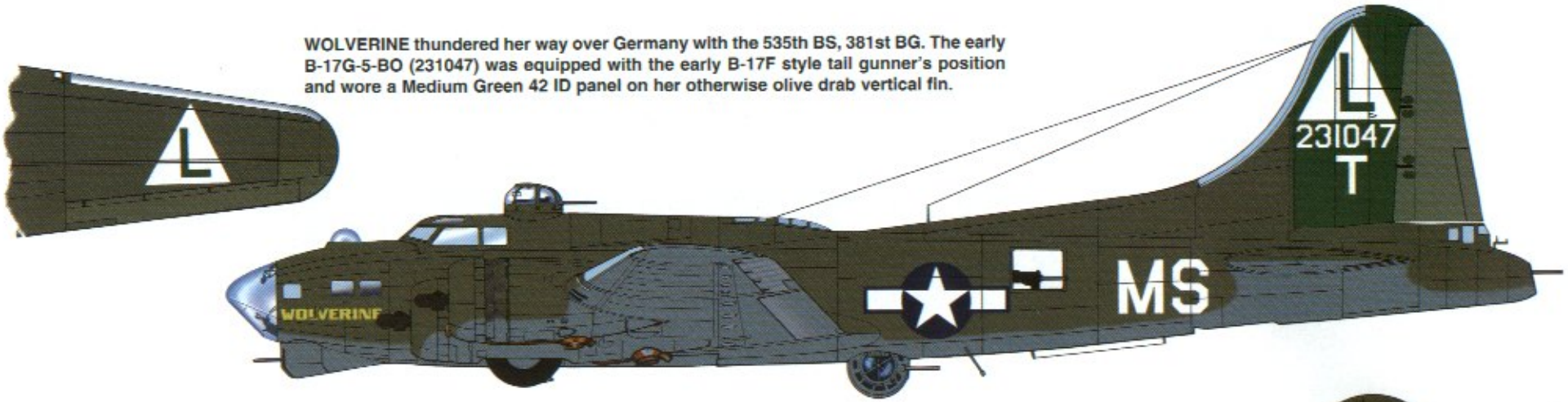
(Below) B-17G-90-BO (44-83684), used in the movie Twelve O'Clock High, was photographed at East Alton, Illinois Memorial Airport on 29 May 1971. It is now owned by Ed Maloney of the The Air Museum at Chino, CA and is on static display as "Picadilly Lilly". (Paul Stevens via Norm Taylor Collection.)



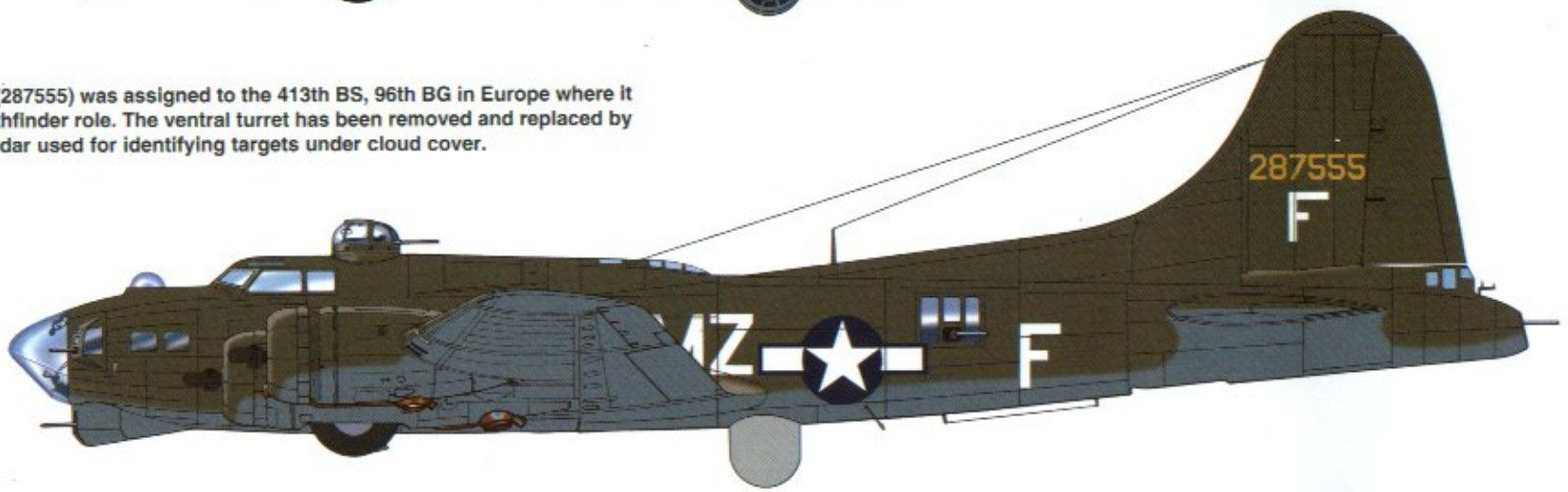
(Above) CB-17G-95-DL (44-83809) outfitted as an executive transport for Headquarters, USAF. At Bolling Field, date unknown. (Clyde Gerdes via Norm Taylor Collection.)

(Below) B-17G-50-BO (42-102516), civil registration N5017N, was flown by EAA. It carries markings of the 601st BS, 398th BG. (Norm Taylor)

WOLVERINE thundered her way over Germany with the 535th BS, 381st BG. The early B-17G-5-BO (231047) was equipped with the early B-17F style tail gunner's position and wore a Medium Green 42 ID panel on her otherwise olive drab vertical fin.

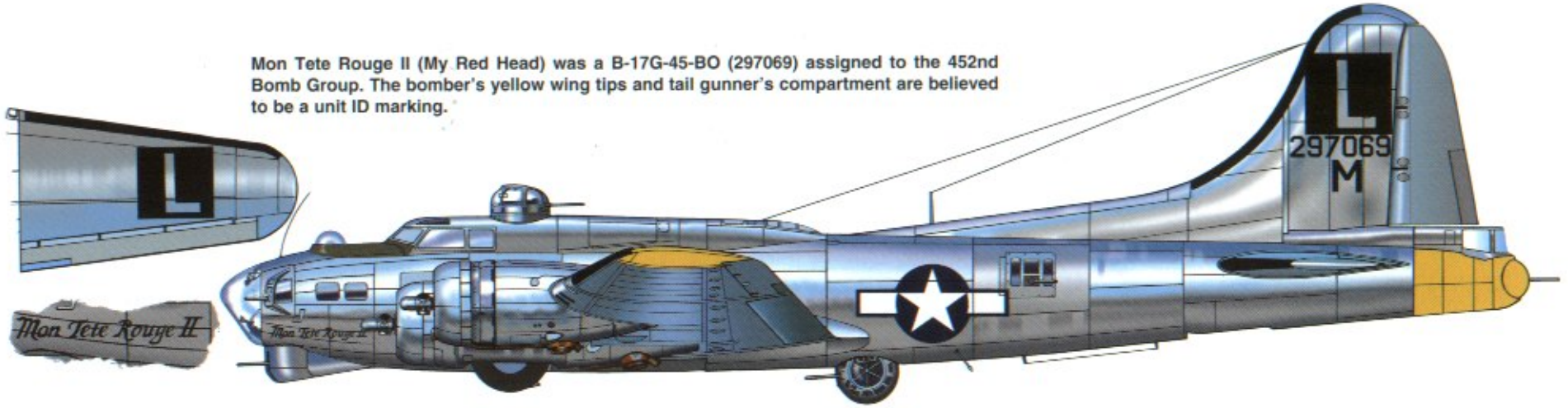


This B-17G-20-VE (287555) was assigned to the 413th BS, 96th BG in Europe where it operated in the pathfinder role. The ventral turret has been removed and replaced by a dome covered radar used for identifying targets under cloud cover.



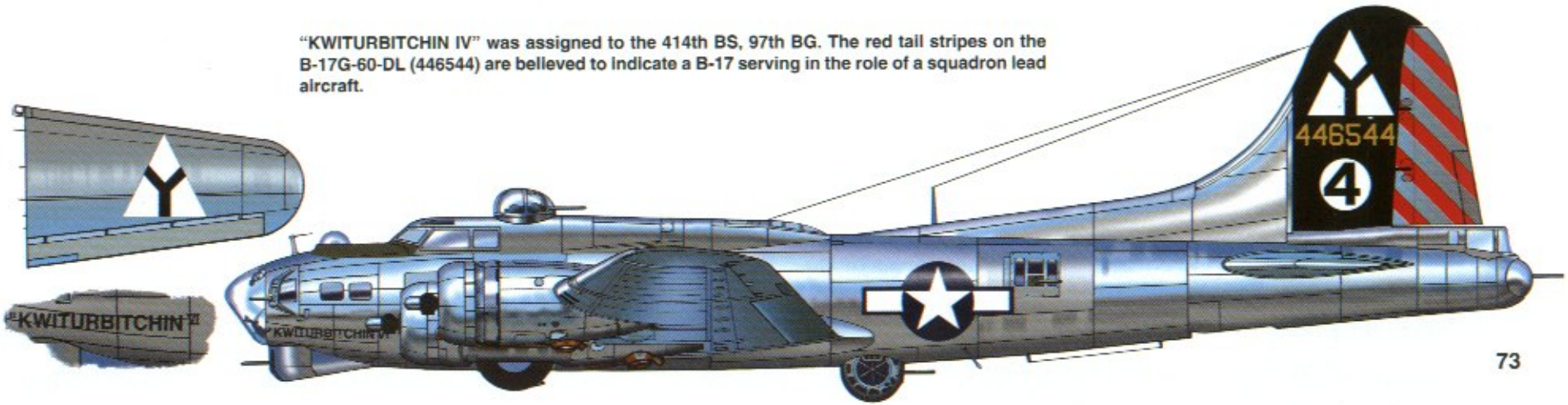
The 364th BS, 305th BG flew this early natural metal B-17G-25-VE (297674) equipped with the early B-17F style tail gunner's compartment. The black triangle and natural metal G were repeated on the upper starboard wing.

Mon Tete Rouge II (My Red Head) was a B-17G-45-BO (297069) assigned to the 452nd Bomb Group. The bomber's yellow wing tips and tail gunner's compartment are believed to be a unit ID marking.



The 545th BS, 384th BG flew this natural metal B-17G-45-BO (297271). The US insignia has been toned down with gray paint. The B-17 carried 43 mission markers along her nose and repeated the triangle P marking on the upper starboard wing.

"KWITURBITCHIN IV" was assigned to the 414th BS, 97th BG. The red tail stripes on the B-17G-60-DL (446544) are believed to indicate a B-17 serving in the role of a squadron lead aircraft.

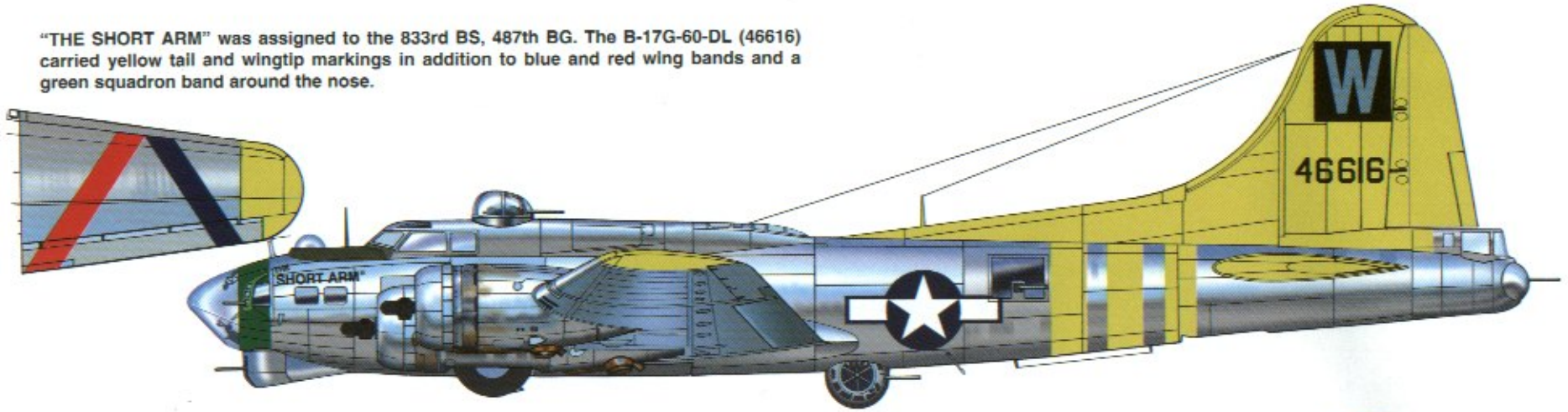


(Above) One of the more famous Flying Fortresses was B-17G-40-BO (42-97061) GENERAL "IKE" was christened by General Dwight D. Eisenhower on 11 April 1944. The artwork was done by Tony Starcer. "Ike" flew with the 401st Bomb Squadron, 91st Bomb Group, serving as the group lead ship on many raids. It survived the war, but not the scrap heap. (Robert L. Astrella via Norm Taylor Collection.)

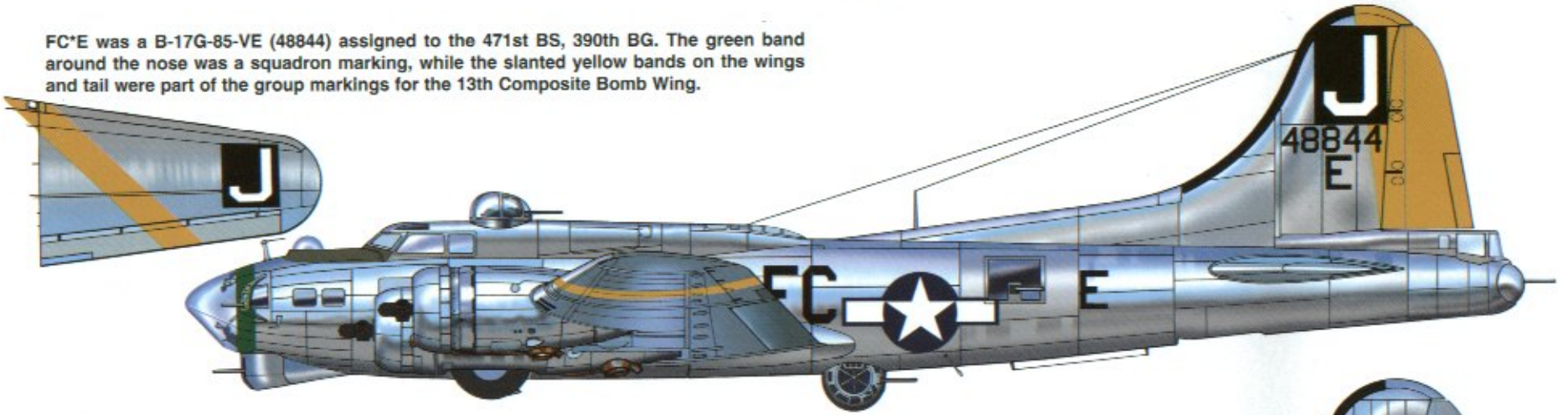
(Below) B-17G-95-BO (43-38814), was disarmed at Furth, Germany in 1945. A veteran of the 95th Bomb Group, which claimed the top gunner ace in the 8th Air Force, SSgt D.W. Crossley, a tail gunner who had 12 kills. The 95th was disbanded in August of 1945. (Chris Goodman via Norm Taylor Collection.)

SONGOON RITA, a B-17G-65-BO (43-37509), was a veteran of 81 bomb missions and five supply missions before war's end is at Bradley Field, Connecticut in May of 1945. (LtCol Mike Moffitt via Norm Taylor Collection.)

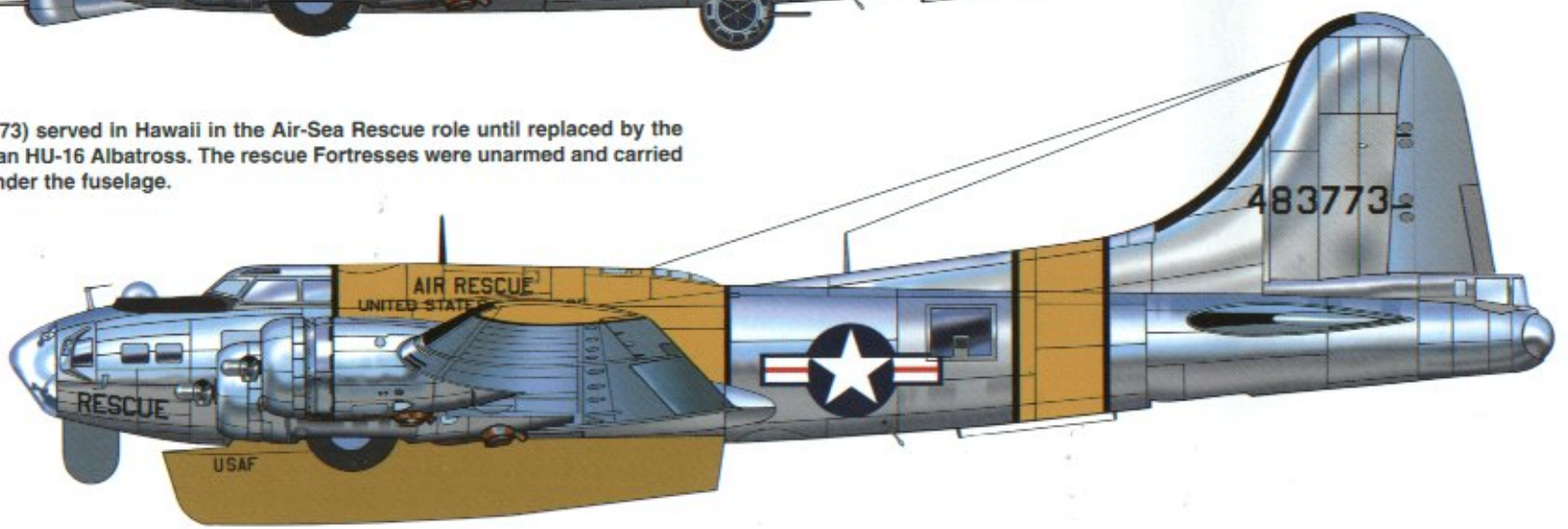
"THE SHORT ARM" was assigned to the 833rd BS, 487th BG. The B-17G-60-DL (46616) carried yellow tail and wingtip markings in addition to blue and red wing bands and a green squadron band around the nose.



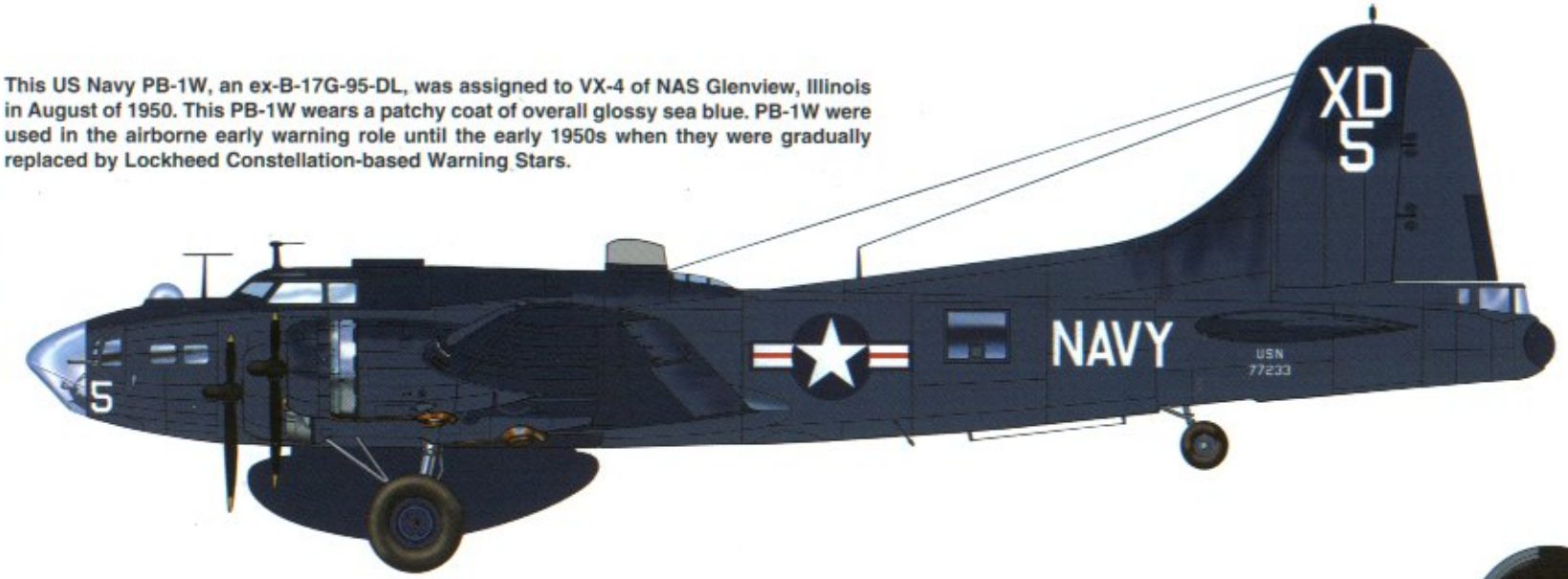
FC*E was a B-17G-85-VE (48844) assigned to the 471st BS, 390th BG. The green band around the nose was a squadron marking, while the slanted yellow bands on the wings and tail were part of the group markings for the 13th Composite Bomb Wing.



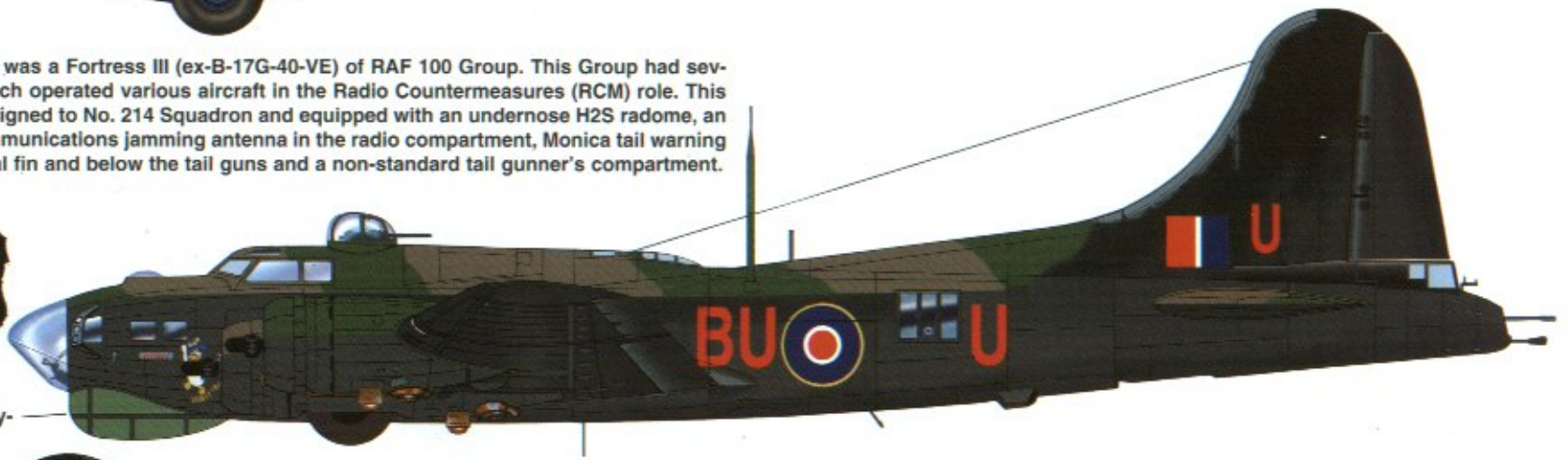
SB-17G-90-DL (483773) served in Hawaii in the Air-Sea Rescue role until replaced by the amphibious Grumman HU-16 Albatross. The rescue Fortresses were unarmed and carried a Higgins lifeboat under the fuselage.



This US Navy PB-1W, an ex-B-17G-95-DL, was assigned to VX-4 of NAS Glenview, Illinois in August of 1950. This PB-1W wears a patchy coat of overall glossy sea blue. PB-1W were used in the airborne early warning role until the early 1950s when they were gradually replaced by Lockheed Constellation-based Warning Stars.

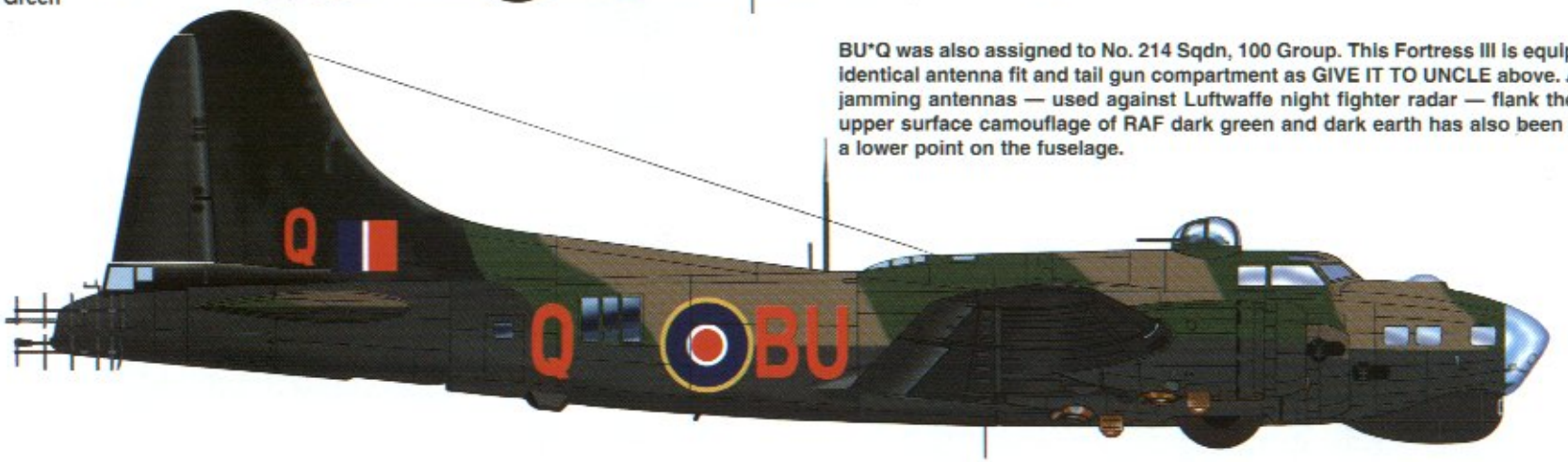


GIVE IT TO UNCLE was a Fortress III (ex-B-17G-40-VE) of RAF 100 Group. This Group had several squadrons which operated various aircraft in the Radio Countermeasures (RCM) role. This Fortress III was assigned to No. 214 Squadron and equipped with an undernose H2S radome, an Airborne Cigar communications jamming antenna in the radio compartment, Monica tail warning radar on the vertical fin and below the tail guns and a non-standard tail gunner's compartment.



RAF Interior Grey-Green

BU*Q was also assigned to No. 214 Sqdn, 100 Group. This Fortress III is equipped with a near identical antenna fit and tail gun compartment as GIVE IT TO UNCLE above. Airborne Grocer jamming antennas — used against Luftwaffe night fighter radar — flank the tail turret. The upper surface camouflage of RAF dark green and dark earth has also been carried down to a lower point on the fuselage.



B-17G-40-VE (42-97976) Just Plain Lonesome of the 324th Bomb Squadron, 91st Bomb Group, at Bassingbourne, in September of 1944. (Norm Taylor Collection.)

THE BIGGEST BIRD was a B-17G-85-BO (43-38306) assigned to the 322nd BS, 91st BG. It was badly damaged by flak on the last combat mission flown by the 91st, a raid to Pilsen on 25 April 1945. Robert Marlow made a forced landing on an emergency airfield on the continent, and the badly damaged Fort was abandoned. The name was a variation on "Big-Assed Bird", a name often given to the B-17 because of the size of it's vertical fin and rudder. Artwork was done by Tony Starcer. (Norm Taylor Collection.)

MAN O WAR II a B-17G-25-DL (42-38083) was the third Fortress in the 91st to carry the name. The first was an F model which was shot down by German fighters over Holland on 30 July 1943. Eight of the crew were killed, six while in their chutes by fighters. The second MAN O WAR limped back to England on three engines on 29 January 1944, on it's first mission. It bellied into a turnip patch and was scrapped. HORSEPOWER LTD. referred to the single engine return of the 2nd Man O War. Number three survived 77 missions before being shot down by German Fighters on 2 November 1944. (Norm Taylor Collection.)

QUEENIE, one of Tony Starcer's pinups is carried on B-17G-15-LO (42-31353) 322nd BS, 91st BG. QUEENIE flew her first mission on 24 December 1943, and was destroyed by flak over Berlin on 29 April 1944 after having survived major damage from flak and fighters on several previous missions. (Norm Taylor Collection.)

B-17G-85-DL (44-83575) is operated by the Collings Foundation. It is painted as B-17G-30-BO (42-31909) NINE O NINE, of the 323rd BS, 91st BG.The original artwork was done by Tony Starcer. The original NINE O NINE survived the war after completing 140 combat missions. The restoration was photographed at Robins AFB, Georgia on 25 October 1991 by Norm Taylor.

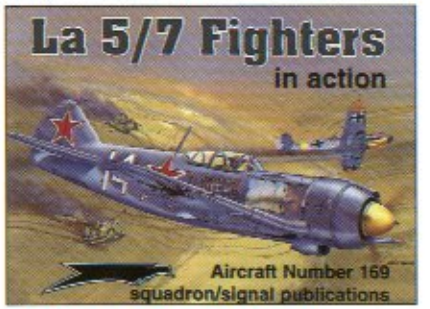
WICKED WITCH B-17G-50-BO (42-102490) of the 323rd BS, 91st BG was also painted by Tony Starcer. It was shot down by flak over Nuremberg on 20 February 1945 after flying 70 missions. (Norm Taylor Collection.)

TB-17G-105-VE (44-85752) became a drone controller. The ball turret has been replaced by an AS-154/APS-10 antenna. Initially modified for use in the Bikini Atoll Atomic testing, five TB-17s returned to the U.S. and were used in testing remotely controlled weapons. (Norm Taylor Collection.)

Aircraft in Action

1166 Fokker DVII

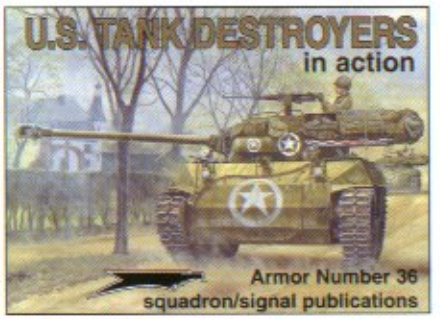
1168 AH-1 Cobra



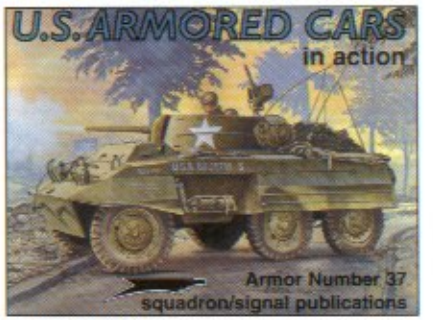
1169 La 5/7 Fighters

Armor in Action

2020 T-34



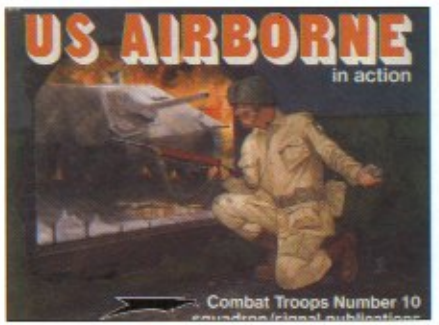
2036 US Tank Destroyers



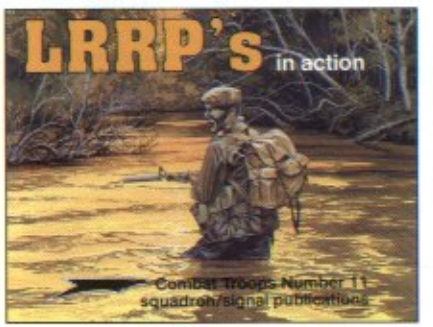
2037 US Armored Cars

Soldiers in Action

3008 British Commandos

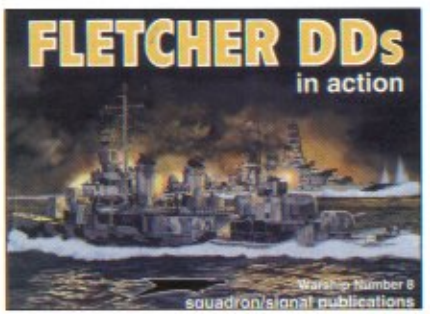


3010 US Airborne

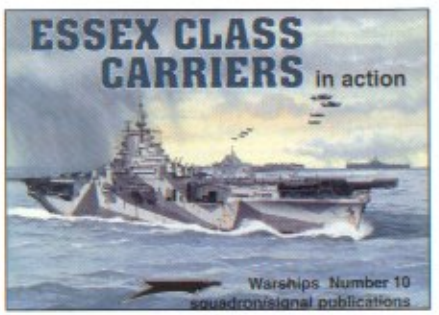


3011 LRRPs

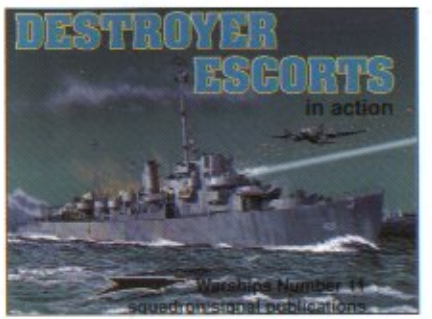
Warships in Action



4008 Fletcher DDs



4010 Essex Class Carriers



4011 Destroyer Escorts

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